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TED STATES Naval Academy

where opportunities of a lifetime begin . . .

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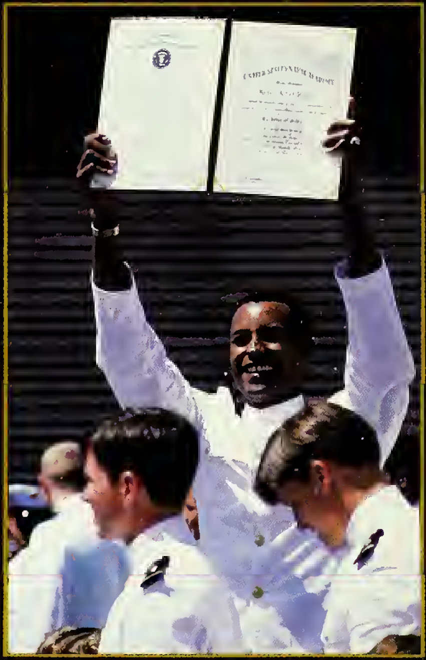
with quality education and training.



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FLARE

UNITED STATES Naval Academy

ANNAPOLIS, MARYLAND

Catalog 1986–1987

NASA National Aeronautics and Space Administration

McCandless Flies First "Solo" in Space

> *"Options at the*
> *Naval Academy can be*
> *developed into a*
> *wide variety of career*
> *specialties—all challenging,*
> *some out of this world . . ."*
>
> Captain Bruce McCandless,
> U.S. Navy
> Class of 1958

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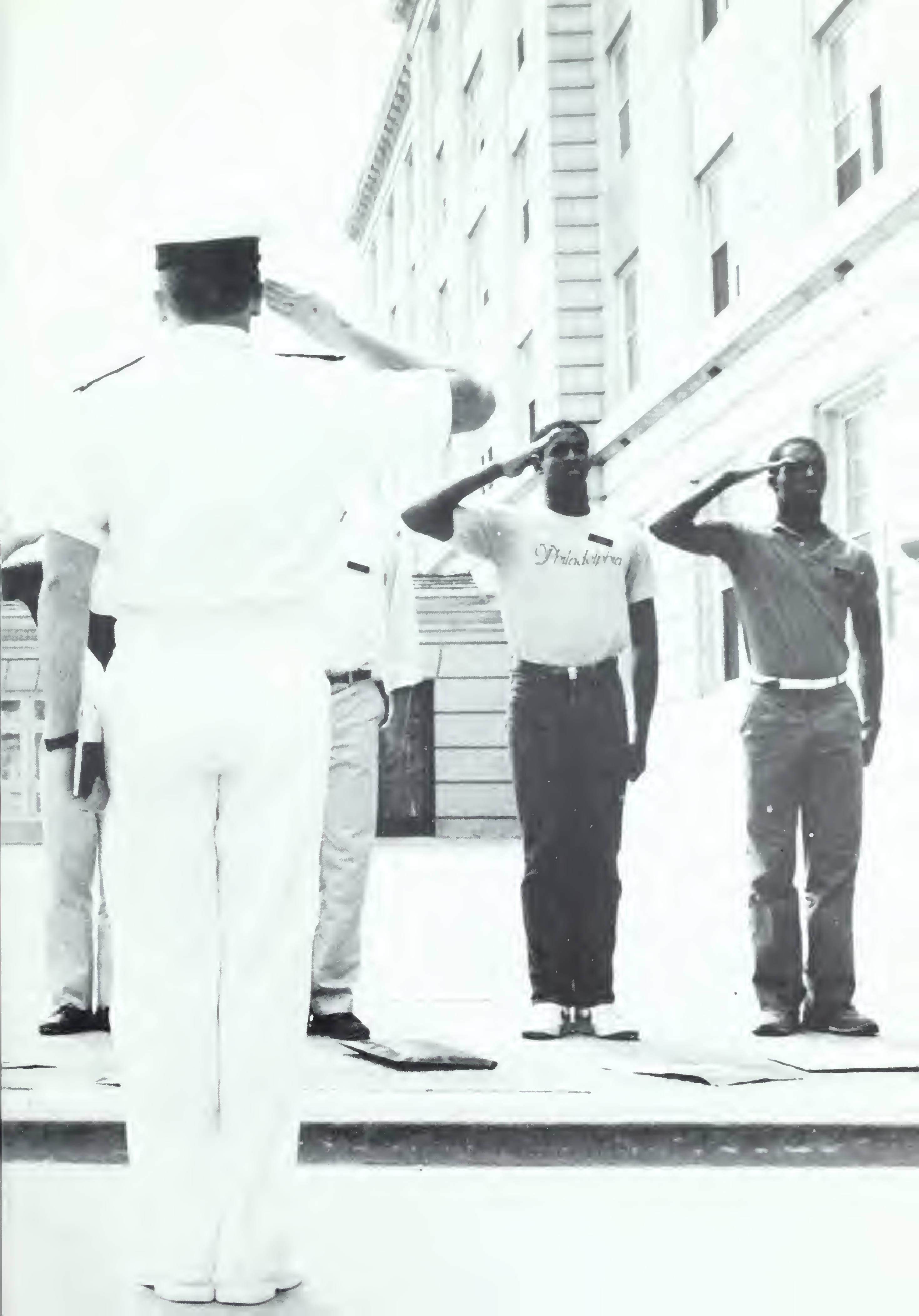
United States Naval Academy Graduate Bruce McCandless Flies First "Solo" in Space

Navy Captain Bruce McCandless II, Naval Academy Class of 1958, orbits the earth as an untethered human satellite during space shuttle mission 41-B February 7, 1984, in this NASA photograph. His spacewalk featured the first use of a nitrogen-propelled, hand-controlled device called the Manned Maneuvering Unit, which McCandless helped to engineer and test. The unit gives astronauts much greater mobility than previous spacewalkers, whose movements were restricted by tethers to their spacecraft.

Captain McCandless is one of 28 Naval Academy graduates who have become astronauts and mission specialists in the United States space program.

MISSION:

To prepare midshipmen
morally, mentally, and physically
to be professional officers
in the naval service.


Philadelphia

Opportunities of a lifetime!

It's difficult at a young age to decide what your life's work will be. As a high school senior, Bruce McCandless certainly had no idea that he would find success as an astronaut. The best a talented young person can do is to choose an education that leads to a variety of career alternatives. The United States Naval Academy does just that.

Naval Academy graduates may choose to become surface ship or submarine officers, with the option to specialize in nuclear power. They may train as pilots or naval flight officers, and some go on to become astronauts. Others may choose to serve on the ground or to fly as Marine Corps officers. No other service academy offers such a wide range of career options.

At the Naval Academy, midshipmen earn a respected bachelor's degree majoring in one of eight engineering, six science, or four humanities programs. They have opportunities to play a wide variety of intramural sports or on one of twenty-three men's or ten women's varsity teams against some of the best competition in the nation. They can choose from more than eighty extracurricular activities ranging from music to scuba diving. And the summers bring the chance to train in Navy ships, submarines and aircraft, or to sail across the ocean or learn to parachute. The total experience develops sound judgment, self-confidence, leadership, and strong moral character.

If you've done well with opportunities in and outside of school, are physically active and enjoy a challenge—you can succeed at the Naval Academy. You can develop all of your potential, testing and pushing back your limits. It isn't easy but, with determination, you can do it. As virtually every graduate will tell you, the rewards are worth the effort.

Graduating from the Naval Academy commits you to five years of naval service for your country. In exchange, the Naval Academy's commitment to you is the opportunity of a lifetime. I've found it exciting, rewarding and fulfilling for more than twenty-seven years. So has my classmate, Astronaut Bruce McCandless. Perhaps you would, too.

CR Larson

Charles R. Larson
Rear Admiral, U.S. Navy
Superintendent

Class of 1958

UNIT
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Contents

Opportunities of a Lifetime 5
The Naval Academy Commitment 8
The Years 1845–1986 14
Life at Annapolis 22
The Naval Profession 60
Admissions 68
The Academic Challenge 94
Courses of Study 106
Professional Training 148
Varsity and Intramural Athletics 156
Extracurricular Activities 166
Administration, Faculty, and Staff 172
Honors, Awards, and Organizations 192

Appendices

Form Letters 198
Special Medical Considerations 200
Foreign Students 204
Oath of Office and Entrance Day Procedures 206
Naval Academy Information Officers 208
Graduate Education Programs 211

Index 213
Naval Academy Calendar 215
Candidate Calendar 216

CHAPTER 1

The Naval Academy Commitment

The Naval Academy makes a commitment to every young man and woman accepted into the Brigade of Midshipmen. New midshipmen are assured of the opportunity for a solid, first-rate college education which is nationally respected. They also are presented the opportunity to grow personally, learning integrity, leadership, and the heights of their own abilities. Finally, they are promised comprehensive professional training that will prepare them well for challenging opportunities later as Navy and Marine Corps officers.

There is still another part of the Naval Academy commitment that reinforces everything else. The admissions process is designed to accept only those applicants who can meet the academic and military challenges at the academy. Therefore every midshipman is guaranteed the opportunity and support necessary to succeed. Members of the Naval Academy's faculty and staff are committed to this principle. The personal counseling network, small class sizes — typically of 20 or fewer students, protected study periods, availability of extra academic instruction until 11 p.m. daily, modern educational facilities, and sponsor program all reflect that commitment. The fact that more than 75 per cent of those entering the academy successfully complete the four-year program is proof positive of the commitment.

In return for the Naval Academy's commitment, midshipmen themselves make a commitment. They accept the challenge of a rigorous program integrating academic studies, military training, physical education, and athletics. They also take an oath of office accepting appointment as a midshipman in the United States Navy, the first step toward becoming Navy and Marine Corps officers.

Service to Country

The purpose of the Naval Academy is to prepare midshipmen to become professional officers in the naval service. No one expects midshipmen to know for certain whether a military career is for them. This major commitment develops in due time, if it is to come. On the other hand, young men and women should enter the Naval Academy fully prepared to undertake the challenging four-year curriculum and to serve as a Navy or Marine Corps officer for five years after graduation. They should have an open mind about their futures after those five years. Hence, a high school student who definitely has decided to pursue a career in law, medicine, theology, or business should not enter the Naval Academy.

"We develop leadership, moral sense, and ethical integrity at the Academy. We teach people to respond under stress, to develop self-discipline. The education received here enables our graduates to succeed in or out of the military."

Rear Admiral
Leon A. Edney, USN
Class of 1957

Besides an interest in the naval service, new midshipmen also are motivated to serve their country. The Brigade is a patriotic group of individuals, proud to be learning a profession that helped win the nation's independence and still protects its freedoms.

Education

A sound college education is the foundation for every profession in society. The naval profession is no exception. Since its founding in 1845, the Naval Academy has provided a sound education for future naval leaders. In recent years, the growing complexity of the Navy has broadened the requirements for undergraduate education at Annapolis.

Basic naval subjects still are required, but midshipmen all now choose a major area of study. These majors range from engineering, oceanography, and mathematics to history, economics, and political science. All midshipmen, regardless of their major selection, study a core curriculum of engineering, science, math and humanities courses, which constitute firm foundation of their academic programs. Whatever their major, Academy graduates are well prepared for service as Navy or Marine Corps officers in any of the principal warfare specialities.

Professional Training

The Naval Academy does much more than simply offer a sound college education. The program includes military training, physical education, and the study of the principles of the naval profession. The purpose of the whole

program at Annapolis is to produce self-confident leaders who accept and carry out their responsibilities to the nation they serve and to the men and women entrusted to their command. This is not an easy goal, and no one should come to the Naval Academy with the idea that the training program is a spare-time adjunct to the educational program. Professional training is an integral part of Academy life, throughout the four-year course.

The ultimate objective of the training that begins at Annapolis is to produce officers who can rise to command — professional officers who are physically strong, mentally agressive, and who have a solid foundation in science, technology, and the humanities. Officers who have high standards of honor, duty, and responsibility. Officers who relish a challenge and thrive on accomplishment.

English sea captain and author Joseph Conrad described the challenge of command at sea, a role known by many Naval Academy graduates:

> *"In each ship there is one man who, in the hour of emergency or peril at sea, can turn to no other man. There is one who alone is ultimately responsible for the safe navigation, engineering, performance, accurate gunfire, and morale of his ship. He is the commanding officer. He is the ship."*

"I haven't had any trouble with the professional courses. I guess it's because I feel they are the most important of all the courses that we have here."

Years at Annapolis

Plebe year at the Naval Academy is tough! It's a year of academic and professional development in a new and different environment. There is pressure and stress, and the necessity to learn to use time better than ever before. The challenge is mental, moral, and physical for the entire year.

For those with no military experience, it is difficult to imagine how tough and demanding plebe year is. Midshipmen, recent graduates, and alumni can describe what life as a plebe is really like.

Beyond plebe year, the Academy regulations apply with decreasing severity until, during first class (senior year), there is a great deal of freedom in choosing what to do and where to go. However, along with the increased freedom comes increased responsibility. The first class, and particularly the midshipmen officers chosen from the first class, are charged with much of the responsibility for running the Brigade. Student government became reality at the Naval Academy long before it was discussed at most other institutions. It's an important part of the training.

Four years at Annapolis are not easy. No achievement so worthwhile is ever easy. And few achievements are so satisfying. By the time of graduation, there is the opportunity to develop the full potentials for scholastic achievement, physical condition, and leadership ability.

Travel and the Sea

The Naval Academy is linked with the sea through its history, its mission, its day-to-day work, and its future. From the Yard can be seen ocean-going ships in the Chesapeake on their way to and from Baltimore. Whatever the month, part of the Academy's fleet of more than 100 small-craft — sail and power — is underway on the Severn River or out on the Bay.

Some entering midshipmen are familiar with the sea; others are not. Many from each background are attracted by the adventure, travel, and excitement always associated with the sea. All midshipmen learn to know

the sea as part of their professional training.

Two of four summers at the Academy will be devoted to training in ships of the Navy. After plebe year, youngster cruises take midshipmen to ports along the East or West coasts, to the Caribbean, or to distant ports in Europe or the Far East. Recent Academy cruises have gone to a number of Mediterranean and Northern European countries, as well as to Hawaii, Australia, Japan, and Hong Kong in the Pacific.

On youngster cruise, midshipmen stand the crew's watches aboard ship, applying much of what they have learned in professional courses during plebe year. Similarly, on first class cruise during the summer preceding the last academic year at the Academy, midshipmen stand the watches of a junior officer, applying again their professional training and education.

The ties between practical work at sea and academic work at Annapolis are representative of the balance between military training and education which is central to the development of professional naval officers at the Naval Academy.

"Clear maritime superiority must be reacquired if this nation is to survive. We must be capable—and be seen as capable—of keeping our access to areas of our vital interest secure. This is not a debatable strategy. It is clearly both a national objective and a security imperative."

John F. Lehman, Jr.
Secretary of the Navy

CHAPTER 2

The Years 1845–1986

From 1845 to 1986, as the nation's responsibilities and needs for seapower have grown, the Navy has increased greatly in size and complexity. Keeping pace, the Naval Academy has responded to every challege, moving from sail to steam and into the nuclear age. The Academy has improved facilities and revised its programs to prepare second-to-none professional leaders for the United States Navy.

The Naval Academy was founded as the Naval School in 1845 by the Honorable George Bancroft, distinguished historian and educator, and Secretary of the Navy in President James K. Polk's Cabinet. It opened in Annapolis, Maryland, on the 10-acre site of the Army's nearly abandoned Fort Severn, where the Severn River empties into the Chesapeake Bay.

Commander Franklin Buchanan served as the first Superintendent of the Naval School. His seven-member faculty of four officers and three civilians taught English grammar and composition, mathematics, geography and history, navigation, gunnery and the use of steam, and Spanish and French languages. The course of study required five years: the first at Annapolis, three at sea, and back to the School for the fifth. Sixty midshipmen, comprising two classes, attended the Academy's first convocation.

In 1850–51, the Naval School became the U.S. Naval Academy, and the course of study was condensed to four academic years. Summer training cruises gave the midshipmen seagoing experience to augment their classroom work. Thus, the forerunner of today's basic four-year curriculum and summer cruise program first appeared at the Naval Academy well over 100 years ago.

During the Civil War, the Naval Academy moved temporarily to the more secure surroundings of Newport, Rhode Island. Following the war, the midshipmen returned to Annapolis to stay. During these early years, the Academy was one of the few institutions in America offering a sophisticated, technical undergraduate program. In 1879, this excellence was recognized by the Paris Exposition in the form of a certificate for the "Best System of Education in the United States."

In the late 1870s, Lieutenant Albert A. Michelson, a graduate of the Class of 1873, performed his world-famous measurement of the velocity of light while serving as an instructor in the Academy's Department of Physics and Chemistry. Michelson continued his brilliant scientific work after leaving the Navy, and, in 1907, he became the first American scientist to receive a Nobel Prize. Albert Einstein once paid Michelson the supreme compliment when he publicly acknowledged the debt that the development of his

"I shall be very glad when the day comes that I can leave here, for I have to get up before daylight and study until late at night. You know studying never agreed with my constitution."

Midshipman
Garret V. Denniston,
Class of 1846

theory of relativity owed to Michelson's work. Today, the science wing of the Academy's science and mathematics complex is named Michelson Hall. The Academy's Mahan Hall honors another early distinguished graduate, Alfred Thayer Mahan. His writings on seapower and history are classics in the field.

Beginning in 1883, the Naval Academy began commissioning Marine Corps officers, who joined the succession of graduates who have served with distinction in peace and war for over 140 years. Admirals Dewey, Sims, King, Nimitz, Halsey, Spruance, and Burke and Marine Generals Lejeune, Russell, Greene, and Cushman earned their place in history. So, also, have astronauts Shepard, Schirra, Lovell, Carr, Stafford, and Anders. Admiral Hyman G. Rickover, a 1922 graduate of Annapolis, personified the Navy's nuclear power program for a generation. Rickover Hall, the engineering studies complex, is named in his honor. A 1946 graduate, Jimmy Carter, earned a place in history as the 39th President of the United States.

Following accreditation of the Naval Academy by the Association of American Universities, Congress passed a law in 1932 authorizing the Academy to award the Bachelor of Science degree to graduates. The Middle States Association of Colleges and Secondary Schools first accredited the Academy in 1947. In 1958, College Entrance Examination Board tests replaced Academy-prepared entrance examinations. Since 1970, candidates have had the option of taking the CEEB tests or the American College Testing Program test for admission.

Electives, validation, and "overloads," introduced in 1959, marked the end of the Academy's traditional fixed curriculum. This was followed by

"No man needs sympathy because he has to work, because he has a burden to carry. Far and away the best prize that life offers is the chance to work hard at work worth doing."

THEODORE ROOSEVELT

the introduction of the Trident Scholars program in 1963; the advent of the Academy's first civilian Academic Dean and the introduction of minors and (for some) majors programs of study, both in 1964; and, in 1970, the adoption of a required majors program for all midshipmen. Designated Bachelor of Science degrees in certain engineering majors were first awarded by the Academy in 1969. Seven engineering majors now lead to designated degrees. All are nationally accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

An Academic Advisory Board of distinguished Americans, formed by the Secretary of the Navy to advise and counsel the Superintendent on academic matters, has met periodically at the Academy each year since 1966.

Legislation authorizing the admission of women to the service academies "consistent with the needs of the services" was signed by President Ford in October 1975. The Naval Academy admitted its first women midshipmen (81) on July 6, 1976. Now, about 125 women are admitted each year.

Yard and Facilities

Long recognized as one of the most beautiful, historic institutions along the eastern seaboard, the Naval Academy was designated a U.S National Historical Landmark in 1963 by the Federal government. Each year, over one million visitors tour the grounds and buildings of the Academy. Everyone is welcome during daylight hours, and a visitors' center offers guided tours, maps, and information. Annapolis is less than an hour's drive from Washington, D.C., and Baltimore, Maryland.

Physical and academic facilities have kept pace with the demands of the curriculum and the Fleet. Fort Severn's original ten acres have grown to today's 322 acres. Much of this new acreage has resulted from a series of landfills in the Severn River. For example, a landfill completed in 1959 added 56 acres for the athletic fields and new buildings. Construction of a number of buildings in use today, including the chapel, several academic buildings, and core areas of Bancroft Hall—the midshipmen's dormitory, began in 1899 with a Congressional appropriation of ten million dollars. Ernest Flagg was the architect; the style, French Renaissance.

Ensuing years saw the addition of new wings to Bancroft Hall; the construction of Mitscher Hall, containing an all faiths chapel, a chaplain's center, and an auditorium; the construction of Halsey Field House; and the construction, with privately donated funds, of the nearby Navy-Marine Corps Memorial Stadium. A multimillion-dollar renovation of Bancroft Hall was completed in 1965.

Beneath the chapel's towering dome lies the crypt of John Paul Jones. Throughout the Yard stand other monuments and mementoes commemorating the deeds of great naval heroes and honoring the Navy's finest traditions.

The Naval Academy is in the final phase of a major campus-wide construction and rehabilitation project. Key structures completed in this plan include the science building, Michelson Hall, and the adjoining mathematics building, Chauvenet Hall, both completed in 1968. The 650,000-volume capacity Nimitz Library was completed in 1973. An adjacent engineering building and laboratory complex, Rickover Hall, was completed in 1975. New interiors, including modern classrooms and laboratories, were con-

"Our alumni are aware that the Academy has higher credentials than ever, and they worry that you can carry recruiting of the best minds too far. But we haven't gone too far—we're still training effective leaders with a balance of brains, physical ability, and good sense."

Vice Admiral
E. C. Waller, USN (Ret.)
Superintendent, 1981–83
Class of 1949

structed in Maury, Sampson, and Luce Halls. A full range of facilities and services for student and faculty research, computer-aided education, and educational television is available throughout the academic complex. All academic areas are air-conditioned.

In recent years, privately donated funds from the Crown family, friends, and alumni made possible the Robert Crown Center, home of the Intercollegiate Sailing Hall of Fame and new waterfront headquarters for our sailing program. Donated funds have also provided a beautiful student activity center in Dahlgren Hall, which boasts an indoor ice skating rink, a cafeteria, lounges, and game rooms.

The Naval Academy Oceanography Department's scientific center is the Hendrix Oceanographic Laboratory, located on a pier on the Severn River opposite the Crown Sailing Center and dedicated in 1985. Much of the lab's furnishings and equipment represent the contributions of Naval Academy alulmni, especially from the Hendrix family. The 3,500-square foot, multifunction laboratory supports today's emphasis on oceanography in the Navy.

Construction of the newest athletic complex, Lejeune Hall, featuring Olympic-style swimming and diving facilities and a six-ring wrestling arena, was completed in 1982. Macdonough Hall, the Academy's oldest multipurpose athletic complex, has been redesigned and rebuilt from the walls in. When it reopens in 1986, Navy soccer, lacrosse, gymnastics, fencing, and boxing will be headquartered there.

The center for daily living is Bancroft Hall, one of the largest dormitory complexes in the world. Stretching over many acres, it accommodates the entire 4,500-member Brigade. All of the basic amenities for daily living, as well as many for recreation, are found in Bancroft Hall.

The Museum

The Naval Academy Museum serves as an inspiration to midshipmen by providing tangible evidence of some of the most famous and exciting episodes in our nation's history. Its collection of more than 50,000 individual items offers a unique educational opportunity, providing both faculty and midshipmen a valuable and convenient reference source for the study of naval history.

While most of the museum's valuable collections are located within the museum, other items of exceptional interest and value are located in the chapel, in Bancroft and Rickover Halls, and in other buildings throughout the Academy. The museum contains some of the finest ship models in the world, including the famous Henry Huddleston Rogers Collection; a superb collection of 13 historical marine paintings by Edward Moran; the Beverley R. Robinson Collection of naval battle prints; an outstanding collection of items relating to the life of John Paul Jones; the table from the mess deck of the battleship *Missouri* on which was signed the instrument of surrender ending World War II; valuable collections of manuscripts and extensive photographic files; and thousands of other significant items relating to the history of the Navy, the Marine Corps, and the Naval Academy. Included are collections of personal items of Decatur, Farragut, Dewey, Sims, Halsey, and other renowned American naval leaders. Museum items in Bancroft Hall include the flag hoisted by Commodore Oliver Hazard Perry at the Battle of Lake Erie on which were emblazoned the immortal words of the dying Captain James Lawrence, "Don't Give Up the Ship!"

CHAPTER 3

Life at Annapolis

The Naval Academy is charged with the responsibility of preparing midshipmen for service as commissioned officers in the U.S. Navy or Marine Corps. In fulfillment of this responsibility, the staff and faculty must ensure not only that the academic and professional programs are first-rate, but also that midshipmen are prepared morally and physically for the rigors of commissioned service. This requires careful organization and a clear set of priorities.

During the academic year, first priority is given to studies, and each midshipman has ample time for out-of-classroom study and research. On weekdays, following the last class of the day, midshipmen participate in intramural or varsity sports and extracurricular activities.

During the summer months, the emphasis swings to professional training, and upperclassmen engage in a program of summer cruises at sea or in indoctrination visits and training at selected naval shore activities. Upperclassmen also enjoy an extended leave period during the summer.

Moral Development

Moral development is a unique and vital part of the Naval Academy's four-year program. There is an Honor Concept to support and live by. Its standards are high and unequivocal, and every midshipman is expected to measure up.

Entering midshipmen reflect a variety of feelings, attitudes, and beliefs, all interrelated and all dependent upon previously developed sets of personal values. Whatever their backgrounds, an established moral base for decision making is presumed for all new midshipmen. But a real test lies ahead. For here, as future officers, midshipmen must constantly examine and evaluate their individual values in the clear light of the ethical requirements of the naval service.

It is assumed at the Naval Academy that midshipmen will not lie, cheat, or steal, but much more is demanded. Midshipmen are taught formally and by example to recognize the common good, to build a community which shares concern for its members, and to make difficult ethical choices. They learn to do their duty, to take careful oversight of their subordinates, and to meet high standards of moral leadership on all occasions. Such attitudes are developed and tested throughout the Academy's military, educational, and athletic programs. Graduates are better officers as a result.

HALL

"They tell you it won't be easy, but you don't know what they mean until you experience it."

Organization

To accomplish the uniquely military aspects of the Naval Academy's mission, the student body is organized into the Brigade of Midshipmen. The Commandant of Midshipmen, a rear admiral or a senior Navy captain, commands the Brigade. He is responsible for instilling high ideals of duty, honor, and loyalty; for providing military indoctrination and physical development; and for imparting the desire to achieve the high standards of performance required of midshipmen and officers of the naval service. In carrying out these responsibilities the Commandant is assisted by an immediate staff of officers, designated the Office of the Commandant, and by five subordinate departments or groups of officers. The departments reporting to the Commandant include the Division of Professional Development, the Brigade Officers, the Physical Education Department, the Brigade Chaplains, and the Midshipmen Supply Department.

The Brigade Officers consist of six battalion officers of the grade of Navy commander or captain or Marine Corps lieutenant colonel, and 36 company officers who are Navy lieutenants and lieutenant commanders and Marine Corps captains and majors. These officers work in close daily contact with the midshipmen in Bancroft Hall. Here, by precept and example; the application of sound techniques of leadership, counsel, and guidance; and, when required, corrective or disciplinary action, midshipmen are measured, molded, and motivated for the day when they will join the Navy or the Marine Corps as commissioned officers.

Bancroft Hall (affectionately known as "Mother B") houses the entire Brigade of Midshipmen. The majority live two or three to a room. In each of the 36 company areas in Bancroft Hall there is a wardroom for informal meetings, reading, or watching television. Fleet Admiral Ernest J. King Hall, a large, air-conditioned dining hall extending seaward from Bancroft Hall, accommodates the entire Brigade, family-style, for meals. Also included in Bancroft Hall are small Catholic, Protestant, and all faiths chapels, with chaplains' offices adjoining; a midshipmen's store for necessities and gifts; tailor and uniform shops; three barber shops, bookstore, cobbler shop, post office, recreation rooms, bowling alleys, and a snack bar ("The Steerage"). On weekends, Memorial Hall, Smoke Hall, and the nearby activity center in Dahlgren Hall provide attractive settings for dances and other recreational activities.

For purposes of military training and administration, the Brigade of Midshipmen is divided into two regiments, each of which is divided into three battalions. The six battalions are each divided into six companies. Midshipmen of all four classes are assigned to each company—the basic military and organizational unit for numerous competitive activities during the year.

Each of the military units, from the Brigade down to the 36 companies and their subordinate platoons, is under the command of a midshipman first class, aided by midshipmen staff and assistants. Midshipmen are selected for these commands and staffs on the basis of their leadership abilities and their other demonstrated officer-like qualities.

Years of Development

The incoming midshipmen are officially designated midshipmen fourth class, but traditionally are known as plebes. In succeeding years, they become third classmen or youngsters, then second classmen, and finally, in their senior year, midshipmen first class.

Plebe Year. The new midshipmen undergo a comprehensive program of military training and indoctrination from the day they enter in early July until the end of their plebe year the following May. Demands upon them and their spare time, all with good reason, seem never-ending. Midshipmen quickly discover during this period what it means to be junior to all and under constant supervision and guidance. Plebe indoctrination is administered by midshipmen of the first class, assisted by the second classmen, and closely supervised by the Commandant and the Brigade of Officers.

"Plebe Summer is like a VCR on fast forward."

Alan Boyd
Class of 1986

Although some form of military training is found at many American colleges and universities, the rigorous routines and challenges of a year-long plebe indoctrination system are unique to the service academies. Complementing other phases of midshipmen training and education, the system directly supports the Naval Academy's mission by promoting the development of leadership abilities and an understanding of the military environment. Its aim is to teach each plebe to:

Exercise self-discipline,
Organize time and effort effectively,
Perform efficiently under stress,
Think and react quickly with good judgment,
Exhibit an exemplary military bearing and appearance.

Plebe year is designed to test and develop. It is a demanding period, requiring midshipmen to stand on their own feet, to produce under pressure, to respond promptly and intelligently to orders and, finally, to measure up to the highest standards of character, honor, and morality.

"It was tough. But you can live with it. Nothing was insurmountable that they gave us to do. And when it's over you're really proud."

"The only comforting thing was knowing that 1,400 other mids were going through the same thing."

The first day of plebe summer is a day that most midshipmen will remember forever. This is scarcely surprising, for in one very busy day, civilians are transformed into midshipmen and begin adjusting to a strange and challenging way of life. It's quite a shock. They get haircuts, wince through innoculations, fill out forms and more forms, and don newly issued uniforms. They learn to square their hats and to stand straight, to respond to orders, to stay in step while marching, and to salute. And they experience their first meal in King Hall.

The pace continues — relentlessly — into the afternoon. By early evening, right hands raised, comes an important pause in the day for the Oath of Office Ceremony, with many proud family members and friends watching: "I . . . having been appointed a midshipman in the United States Navy, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, . . ."

Congratulations are in order, and there are a few minutes to enjoy the feeling. Then, another new class of midshipmen heads for evening meal formation.

The action picks up again during supper. Upperclassmen seem to be everywhere in Bancroft Hall – giving orders, instructing, challenging every step – as plebes struggle to stay afloat in their new home. Survival becomes a problem. Finally, the day (still the first) ends. Taps: It's 10:15, time to collapse into bed.

Reveille jars everyone back to reality. It is 5:45 the next morning. "Another day in which to excel," as the upperclassmen say. And so it goes; there's no letup in sight. Days blur into weeks through the hot summer. Civilian ways and days soon seem far behind.

As the summer progresses, the new midshipmen rapidly assimilate basic skills in seamanship, navigation, and signaling. Infantry drill, firing a .45 calibre pistol, sailing Navy yawls, handling minesweeping launches (MSLs), and participating in a rigorous physical conditioning program all contribute to making each midshipman a proudly versatile individual. Team spirit and the desire to win are developed through competition in a wide range of activities, including athletics, dress parades, and seamanship drills.

Parents' Weekend is held in mid-August. Parents of the new midshipmen have the opportunity to visit the Academy and enjoy the weekend with their sons and daughters. A dress parade, exhibitions in sports, dining in King Hall, sailing with their midshipmen, and the opportunity to meet academic faculty and company officers help convince parents that their sons and daughters are taking their new life at Annapolis in stride.

Upperclassmen return from at-sea training, leave, and other summer activities in late August. Plebe summer is over, but plebe indoctrination continues. The academic year gets underway. Four years of studies have begun, paced by a demanding daily schedule . . .

7:00 – Reveille
6:45–7:10 – Breakfast (optional for midshipmen first, second, and third class)
7:15–7:30 – Special instruction period for midshipmen fourth class
7:35 – Quarters for muster and inspection
7:55–8:45 – First period
8:55–9:45 – Second period
9:55–10:45 – Third period
10:55–11:45 – Fourth period
12:10 – Call to noon formation
12:20 – Noon meal
1:15–2:05 – Fifth period
2:15–3:05 – Sixth period
3:30–4:30 – Drill and parades (twice weekly during fall and spring)
3:30–6 – Athletics. Except for drill and parade periods (and a few midshipmen having a seventh period laboratory), midshipmen spend this time of the day taking part in varsity and intramural athletics and in extracurricular and personal activities.
6:30 – Evening meal formation
8–11 – Study period
11 – Lights out (for plebes)

September brings the excitement of football and other fall sports. During the football season, selected members of the Brigade travel to out-of-town games. The entire Brigade attends home games, and, at the end of the season, travels to Philadelphia for the annual clash with the Black Knights of the Hudson, the cadets of West Point.

"Plebe Summer was the hardest thing I've ever done. You constantly doubt yourself and you wonder if you'll survive, but when it's over – besides being physically fit – you have a tremendous feeling of accomplishment."

Rich Wheat
Class of 1986

"Get in shape before you come . . ."

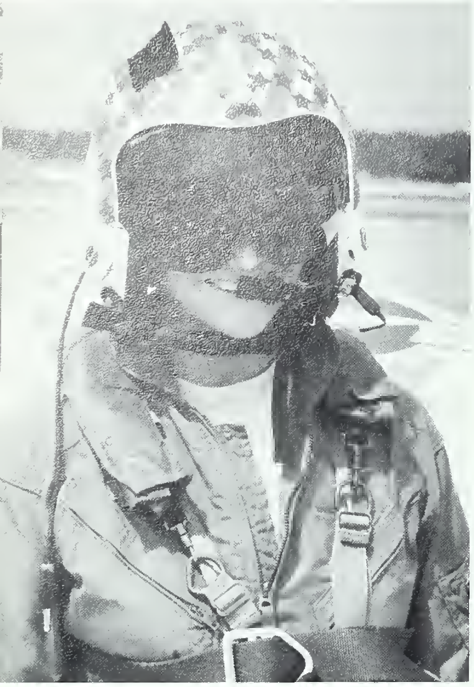
December's final examinations end the first semester, and midshipmen of all classes depart on well-earned Christmas leave. This gives plebes a breather to visit home and gives all midshipmen a welcome break in the academic routine. Leave ends and classes resume in early January. Mid-term examinations in early March are followed by a short vacation for all classes. Later in March, based on personal counseling, plebes begin selecting their majors. The year's academic studies end with examinations in early May. Following a short leave period, midshipmen return for graduation (Commissioning Week) in mid-May—a week-long round of parades, ceremonies, dances, concerts, sailing, and other traditional year-ending Naval Academy activities.

The end of plebe year brings mixed emotions. A feeling of relief that it is over—yes; yet, at the same time, there are well-deserved feelings of confidence and pride that the challenge has been met. And conquered!

"The Naval Academy is the only place in the world where they take away all of your God-given rights at entry and give them back to you, one at a time, over the next four years as privileges."

Third Class Year. Following graduation of the senior class, newly minted third classmen depart on a month or more of training at sea with the Fleet, along with new midshipmen first class. The summer includes about 30 days of leave.

During their first taste of life at sea in the Navy, the midshipmen come to know and respect the sailors and Marines they will later command and



USS WAINWRIGHT
CG-28

"I further decided that the Navy offered two of the things I wanted most—travel, and a chance to move into management responsibility soon."

depend upon as officers. Third classmen serve in many capacities and actively participate in a wide range of shipboard operations. They stand deck, gunnery, operations, and engineering watches; operate ship's boats; and exercise in general shipboard drills.

After at-sea training and summer leave, third classmen return to the Academy for their second academic year and begin work in their majors. And, although the new year brings additional military responsibilities, the lessened emphasis on indoctrination leaves more time for studies and for sports and extracurricular activities. It is a welcome and deserved change of pace.

Following completion of academic studies for their third class year and the chance to enjoy the festivities of their second Commissioning Week, third classmen become second classmen. Two years down, two to go.

Second Class Year. During a fast-moving summer, second classmen undertake professional studies at the Naval Academy—including training in operations and tactics aboard the Academy's patrol craft—and they receive familiarization training in the warfare specialties of the Navy and Marine Corps in travels along the Eastern Seaboard. In New London, Connecticut, each receives an introduction to the submarine service through lectures ashore

"It wasn't till my second year that I had time to wonder why I was here, whether it was worth it. But I had to look at what I was getting here and what I would do if I quit. I don't think I could have gotten a better education at any other school, so the Naval Academy won out."

1054
1060

and through visits and shore cruises on board nuclear-powered submarines of the U.S. Atlantic Fleet. Flight indoctrination in naval training and operational aircraft at Pensacola, Florida, provides a knowledge of the duties of an officer choosing a career in naval aviation. Introductions to the techniques of vertical envelopment, amphibious assault, and ground combat at Marine Corps training facilities in Virginia complete the summer's professional training. Second classmen also enjoy month-long summer leaves.

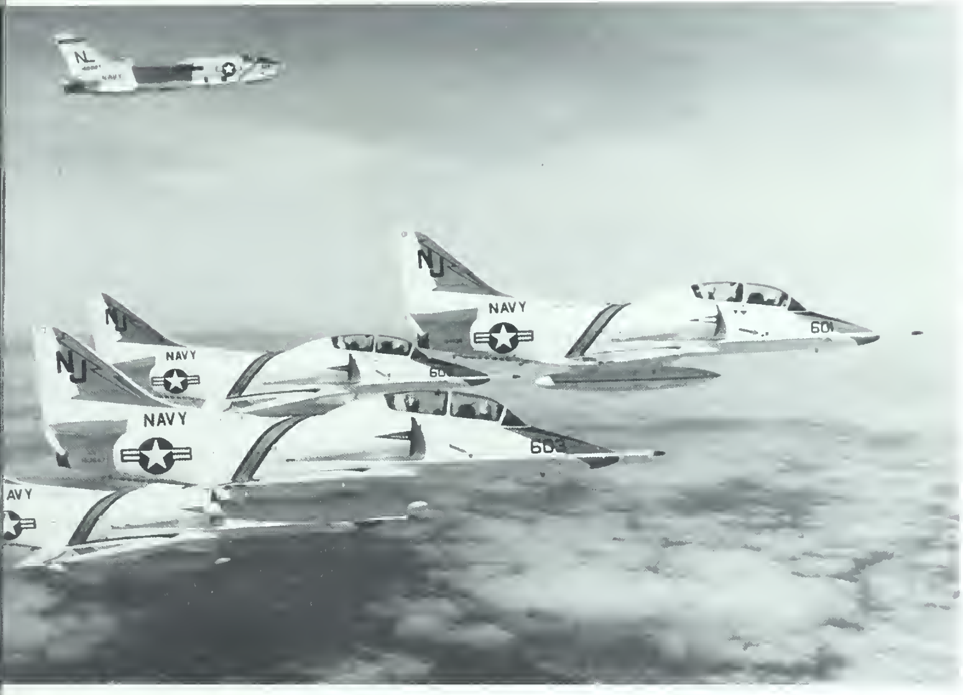
Following summer leave, still greater military responsibilities become theirs as second class midshipmen return to the Academy for their third academic year and enter into increasingly advanced areas of study in their majors. Midshipmen officers are selected from the class and trained to direct the Brigade during periodic absences of the first class. An important role in the indoctrination of the new fourth class is also undertaken by the second class. In addition to contributing to the development of the fourth classmen, this responsibility makes a vital contribution to the second classmen's growth as leaders. There is little time for watching the calendar. And, before long, another Commissioning Week has come and gone, and first class year is underway. Seniors! On top at last: a chance to show how it *should* be done!

First Class Year. During their last summer, first classmen go to sea for training with the Fleet for their second and last time as midshipmen. Here, they have the opportunity to assume the responsibilities and perform the duties of junior officers. On board ships, functioning as junior officers, the first classmen are exposed to the social courtesies, amenities, and customs of wardroom life. Work in navigation, watch-standing on the bridge, exercises in the combat information center and in the engineering spaces, and lectures and studies on other aspects of shipboard life complete the summer's training with the Fleet.

"The experience I had aboard the aircraft carrier Independence *put the lid on it for me as far as flying is concerned. I'm rarin' to go."*

"I spent one summer cruise in the Mediterranean visiting Italy, France, and Spain. We also hit Hawaii on another cruise. I learned a lot professionally with the Marines and had a great time."

"I have flown in a supersonic Phantom jet, conned a nuclear submarine at 400 feet, conned a 550-foot surface ship, rappelled from a helicopter with the Marines and traveled to Europe, and Hawaii. What college kid has done all that?"


NL
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AVY

"Probably when I came here, I wanted to serve my country, but there was also a degree of selfishness. I wanted an education Now I want to be the best naval officer that I can."

"You're encouraged to think for yourself, to develop as an individual and a leader. Initiative counts for a lot here."

Normally, midshipmen visit a number of foreign lands and ports during their training cruises, although some ships may remain in U.S. coastal waters. Depending on their ship assignment, visits may be made to such places as Hawaii, Japan, Hong Kong, Australia, and New Zealand in the Pacific; Gibraltar, Spain, France, Italy, and Greece in the Mediterranean; and Holland, Germany, Denmark, and Norway in Northern Europe. For some, the summer will include training in air and ground warfare with a Marine brigade in Hawaii and at Camp Pendleton, California. A number of carefully chosen members of the first class will also take part in the training and indoctrination of the new plebe class at Annapolis during the summer. All enjoy their last month-long summer leave as a midshipman.

Near summer's end, first classmen return to the Academy to continue their academic studies — their principal responsibility throughout the four years at Annapolis — and to undertake their important new responsibilities for directing the Brigade of Midshipmen. Midshipmen officers, called "stripers," lead the Brigade in parades, ceremonies, and at daily formations. They are responsible for the conduct, military smartness, and competitive records of their units. They are in charge of the midshipman watch organization in Bancroft Hall. The selection of two sets of midshipmen officers during each academic year increases the individual opportunity for their valuable leadership experience.

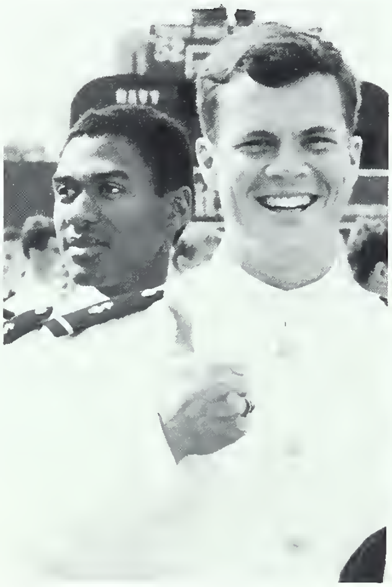
In carrying out these demanding responsibilities, the first class midshipmen must call upon all the leadership skills they have developed during their first three years at Annapolis. And, following this final year of practical leadership experience, they find themselves well prepared at graduation to assume their responsibilities in the Navy or the Marine Corps as newly commissioned officers.

"The upperclassmen in my company who trained us did a good job; they were very fair."

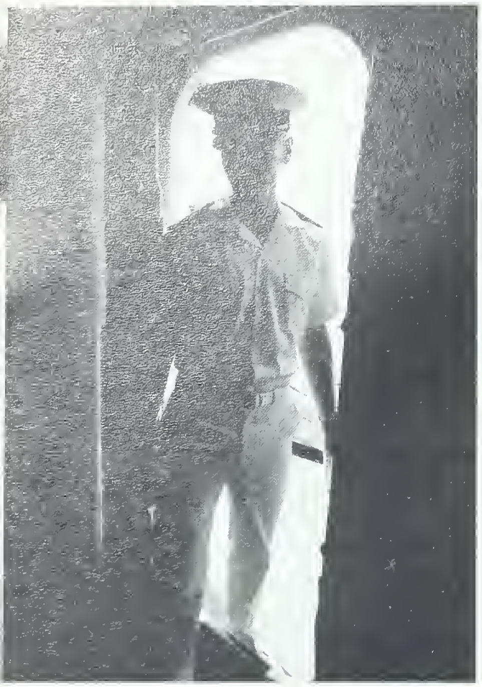
The Honor Concept

A total commitment to the highest standards of honor, duty, and responsibility is a vital goal in each midshipman's professional development at Annapolis. Here, the Honor Concept of the Brigade of Midshipmen plays a key role. In providing a set of principles to live by, rather than a set of regulations, the Honor Concept establishes high standards of integrity for all midshipmen and guides them in measuring up to these standards in everyday situations.

There is simply no place at the Naval Academy for lying, cheating, or stealing. Violations usually lead to dismissal. The concept makes this clear.



"But probably my major gain from the Academy has been an increase in self-confidence. I know I can handle responsibilities. When I graduate, I'll know how to work with people, be a leader ."



"Requirements for being a naval officer get tougher every year. They have to be more sophisticated in many ways than they used to be. To be effective, an officer must be attuned to the social, economic, and political forces shaping the world."

VICE ADMIRAL
WILLIAM P. MACK,
U.S. NAVY (RET.)
CLASS OF 1937

But the concept is more than an administrative device for dealing with moral failure at the Naval Academy. By fostering the development of lasting moral *principles*, it becomes part and parcel of the professionalism expected of graduates as commissioned officers.

The Honor Concept is midshipman-conceived and supported—a living, operational system at Annapolis, with each class of midshipmen participating throughout the year in its interpretation and administration through their elected Company Honor Representatives to the Brigade Honor Committee.

The Professional Training Program

The Commandant directs the Academy's professional training program. He is assisted by the Director of Professional Development. Encompassing a wide range of training, studies, and drills, the program is designed to give graduates a sound foundation in the subjects and skills required of professional officers in the Navy and Marine Corps.

Over 2,000 hours are devoted to building this foundation during the four years at the Academy. Class standing at graduation and seniority as a newly commissioned officer depend in part on a midshipman's professional training performance.

Included in the program are lectures, practical training, physical education, and a variety of evolutions and drills—both ashore and afloat—in which the midshipmen learn by doing. Progressing from basic military and naval knowledge to the presentation of more advanced information and concepts, the program supports and complements both the military life within the Brigade and the professionally oriented academic courses. A description of the courses, drills, and training making up the professional training program is in Chapter 8.

Operations aboard the Naval Academy's yard patrol craft develop and test midshipmen's ship-handling knowledge and skills while underway on the Chesapeake Bay and its tributaries. Yard patrol craft instruction is under the general supervision of officers of the Seamanship and Navigation Department under the Academy's Director of Professional Development. All midshipmen receive operations training aboard the YPs throughout the school year. Some midshipmen earn cruise credit during the summer aboard the Academy's YPs, traveling to various ports and training facilities along the Atlantic seaboard.

The Naval Academy's Yard Patrol Squadron, an extracurricular activity, is also supervised by the Professional Development Division. The organization and operations of the Academy's YP Squadron are similar to those of Navy destroyer squadrons on duty around the world.

The midshipman selected as the squadron commodore is responsible for the overall performance and excellence of the squadron in proficiency competition, inspections, and on cruises. Midshipmen assisting the commodore include a chief staff officer, two division commanders, and an administrative officer. Completing the staff is an engineering officer who supervises training in engineering and ensures proper operation and maintenance of engineering equipment.

Each of the squadron's six yard patrol craft is commanded by a midshipman first or second class selected for ability to assume the responsibilities of a commanding officer. The commanding officer and crew of 20, composed of midshipmen from all classes, get underway three afternoons a week

and conduct classroom training the other two. In addition to weekday training sessions, weekend cruises are conducted to nearby Chesapeake Bay ports and to Washington, Norfolk, and Philadelphia.

Competition between YPs for the Battle Efficiency Pennant is keen, and the crew judged most proficient overall in tactics, deck seamanship, piloting, communications, and engineering is declared the year's winner.

"Here you're accountable for what you do or don't do. You can't leave it up to someone else."

Sailing

Every midshipman is introduced to sailing at the Naval Academy. Beginning with plebe summer, midshipmen learn basic sailing in the Academy's 24-foot Rainbow-class knockabouts, 30-foot Shields sloops, and 44-foot Luders yawls. The program covers water safety, boat handling, sailing techniques, crew work, and marlinspike seamanship.

Following this introduction, many choose to continue as members of the Naval Academy's varsity sailing team. Others will sail for recreation. Midshipmen have use of one of the largest and finest sailing fleets in the world (over 120 craft in all) ranging from sailboards, Lasers, and 420-class dinghies, through the Academy's fleet of some 25 Luders yawls and other offshore racing yachts. Midshipmen compete in intercollegiate sailing events from coast to coast. The Academy's offshore team competes in local regattas and in such major national and international regattas as the trans-Atlantic, trans-Pacific. Annapolis-Newport-Bermuda, and the Chicago-Makinac. Midshipmen win more than their share of honors among the top American colleges and civilian offshore teams of the world. In fact, the Naval Academy has been one of the top-rated intercollegiate sailing teams in North America for the past nine years!

On the purely professional side, midshipmen may volunteer for SAILTRAMID, a special three-week blue-water summer sailing cruise for first and third class midshipmen aboard the Academy's offshore yachts or Luders yawls. This offshore experience exposes the midshipmen to advanced navigation and seamanship concepts and enables them to develop their teamwork and leadership abilities in an ocean environment. Volunteers must complete special courses and training during the year preceding the cruise.

"I had feelings all along while growing up that I should be in the Navy. I always loved the water."

The strong encouragement of sailing at the Naval Academy is no accident. Rather, it reflects the long-standing conviction that lessons learned under sail contribute directly to midshipmen's professional development—for, clearly, the skills and knowledge of seamanship and the sea gained before the mast are the same basic skills and knowledge which have been used by seamen for centuries. Thus, by developing better seamen, the Academy's sailing program contributes to the development of better naval officers.

Aviation Training

The Naval Academy's Aviation Training Program, VT-NA, is a voluntary professional program designed to provide midshipmen with additional knowledge and skills relating to naval aviation. Organized along the lines of a Fleet aviation squadron, VT-NA affords midshipmen of all classes the opportunity to participate in a training syllabus which includes ground school

U.S. NAVAL ACADEMY
AEGIS

STELLATION
ATES NAVAL ACADEMY

MARCHESSE' 88

"You have to give some things up if you come here. You don't have much of a social life in your first year. You can't wear your hair as long as you want to. And you have to give up some of your personal freedom. In a military environment you can't just go and come as you please."

and field trips and (for aviation-qualified first classmen) flight time in general aviation type aircraft. Fleet-experienced aviators of the Navy and Marine Corps supervise the program to ensure standardization and operational safety. Although designed specifically to prepare midshipmen for future careers in military aviation, many midshipmen work toward obtaining their private pilot's certificate through this program.

Leave and Privileges

The amount of leave, liberty, and other privileges granted midshipmen varies directly with their seniority, responsibility, and performance. First classmen not only will have more responsibility in the administration of the Brigade, but also will have more privileges.

There are several regular periods of leave of absence from the Academy during the year. These include a three-week Christmas leave ending the first semester, mid-term leaves, a short leave following the second semester, and month-long summer leaves for the three upper classes.

In addition to leave, midshipmen are granted liberty in the Annapolis area. Studies and military duties permitting, fourth classmen are granted town liberty, within 22 miles of the Academy chapel, on Saturday afternoons and evenings, and liberty within the Naval Academy complex on Saturday mornings and Sunday afternoons. They are allowed to have dates during Commissioning Week and on at least four weekends during the year.

The Naval Academy's unique Plebe Sponsor Program gives fourth classmen opportunities to relax in an informal, family atmosphere away from Academy routine. Officer and civilian personnel and other interested families in the local area sponsor specific midshipmen and invite them to visit. All plebes receive sponsors at the beginning of their first year. Often sponsors virtually adopt their midshipmen, and relationships develop which last beyond the entire four years the midshipmen are at the Academy.

First classmen have town liberty all day Saturday and Sunday morning and afternoon. Second and third classmen have town liberty on Saturday afternoon and evening, and on Sunday afternoon. In addition, first classmen have liberty on Wednesday afternoon and on Friday evening. Weekday liberties begin after classes are completed for the day.

Weekend liberty is granted to upperclassmen. Midshipmen third class are afforded five weekends each semester; second class midshipmen receive eight each semester. First classmen are not limited in the number of weekends they are authorized to take; however, a number are required to remain at the Naval Academy during the weekend in order to carry out the leadership and administrative functions of the Brigade.

FOLGER THEATRE
1985-86 SEASON
A SEASON TO CELEBRATE
OTHELLO
THE MERRY WIVES OF WINDSOR
THE CHERRY ORCHARD
THE MISER
TWELFTH NIGHT

Cultural Affairs Program

To enrich life at the Academy and stimulate a lively interest in the performing arts within the Brigade, the Cultural Affairs Program, sponsored by the English Department, offers many opportunities for midshipmen to attend professional productions of dramas, operas, symphonies, and ballets in nearby Washington and Baltimore. Field trips are scheduled throughout the academic year to the Kennedy Center and to other outstanding theatres. Some outstanding shows are brought to the Naval Academy.

"If you don't have any athletic interest you probably won't be happy here. I've learned to play and really enjoy a lot of sports that I probably wouldn't even have known about at another school."

Physical Education

In supporting the mission of the Naval Academy, the program of the Physical Education Department makes a vital contribution to the development of midshipmen. The program continues throughout the four years. All midshipmen participate.

The program's aims are to develop skill, confidence, teamwork, endurance, agility, and competitive spirit; to develop useful habits of physical fitness; to develop the capability to train and instruct others; and to develop the background and capability to withstand physical hardship. Equally important, the program aims to be enjoyable, to provide a release from the academic routine, to encourage a lasting appreciation for sports in general, and to develop individual skills in carry-over sports for enjoyment after graduation.

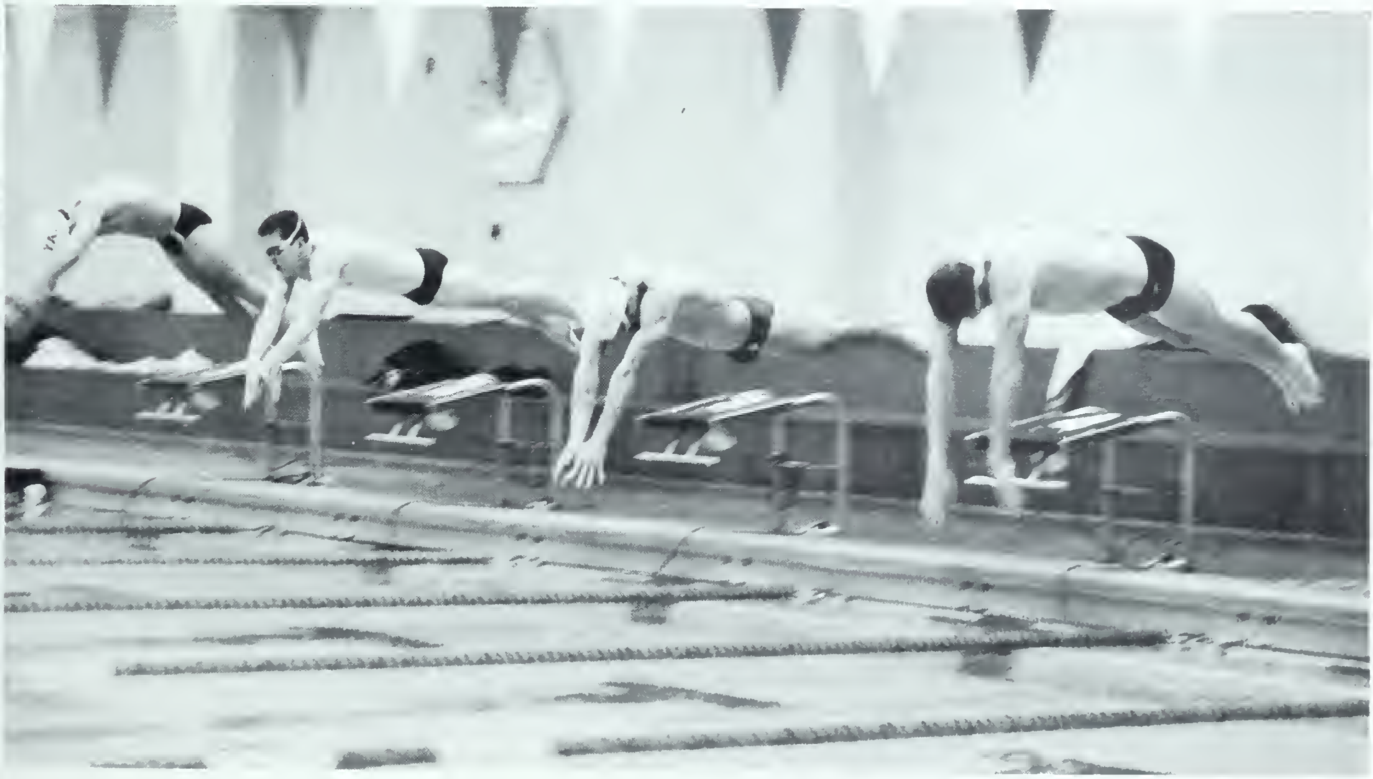
Women participate in the same physical fitness and physical education program as the men except that some adjustments are made in the program's content (no contact sports such as boxing, wrestling, etc.) and standards, recognizing physiological differences.

The program gets off to a fast start during plebe summer. Preliminary testing of swimming capability and general athletic ability is followed by instruction and practice in boxing, wrestling, lacrosse, fencing, soccer, gymnastics, crew, golf, tennis, squash, swimming, and track.

The pace continues during the first academic year. Instruction is given in swimming, boxing, wrestling, gymnastics, golf, personal conditioning, squash rackets, soccer, tennis, and volleyball. In addition, fourth classmen are tested in applied strength, swimming, boxing, wrestling, gymnastics, mile run, and the obstacle course.

The following three years include increasingly advanced instruction and demanding tests. Additional details on the Physical Education Department and its program are in chapter 8.

"You're not just a student here. At the Academy, you have to get involved with people, and that includes being both a team member and a leader."



Religious Activities

The copper dome of the Chapel towers over the other buildings in the Yard at the Naval Academy and, in a sense, serves as a symbol of Annapolis to the outside world. This is more than a coincidence. Over the decades of our history, Americans in uniform have learned by experience that there is a dimension to military leadership—both in and out of combat—which is essential to real effectiveness. This is the spiritual factor, the intangible quality of moral courage.

What is it that strengthens men and women in the daily battles of life? Where do they turn for help and reassurance in times of special stress? What makes them capable of decisions that disregard personal expediency? The answer lies in the spiritual dimension that guides their lives.

Protestant, Catholic, and Jewish services, in both traditional and contemporary form, are held each week. The midshipmen may also attend any of the churches in the community. While attendance at religious services is optional, midshipmen are reminded that, as officers of the naval service, their personal beliefs will often be tested and that, in time of stress, their subordinates will look to them for spiritual as well as professional guidance.

From the first day of plebe summer until the day of commissioning, four years later, the Academy's staff of six chaplains serves and ministers to the needs of the Brigade of Midshipmen. Among other things, they provide personal counseling ranging from faith-centered issues through crises of life and death to future marriage plans.

In exercising a ministry of "presence" throughout the daily life of the Brigade, chaplains sponsor and participate in Bible studies, prayer groups, and instruction classes. They also visit company areas, lead the prayer at evening meal, and become involved in a host of other Brigade events. All of these activities are designed to share and build lasting spiritual resources and to cultivate the strength and inspiration which come from a deeply personal relationship with God.

"God grants liberty only to those who love it, and are always ready to guard and defend it."

DANIEL WEBSTER

"I will never forget my first meal here . . . so much spirit and lunacy combined for a common good."

Dining in King Hall

Meals are special at the Naval Academy. With the possible exception of those plebes who are unprepared for the inevitable blitz of professional questions at mealtime, lunch and dinner are highlights of the day. Menus are varied, imaginative, and hearty. A professional food-service staff heads the efforts of 350 employees, including menu planners, cooks, bakers, and a foodservice team (waiters) of 200. Dining together at 372 tables in King Hall, a large 65,000 square-foot T-shaped dining hall, all 4,500 midshipmen are served a hot meal within five minutes after being seated.

A midshipman's daily diet provides approximately 4,500 calories. All meat is U.S. Choice, vegetables are Grade A Fancy, and dairy products—including milk and cream for making ice cream—arrive daily from the Academy's own dairy farm, just a few miles away. Midshipmen favorites from the galley include steak, Mexican dishes, spiced shrimp, and steamed Chesapeake Bay crabs. Dessert favorites include honey-dipped doughnuts, strawberry yogurt cake, eclairs, specky vanilla ice cream, cherry cheese pie, home-style oatmeal cookies, and ice cream with strawberries.

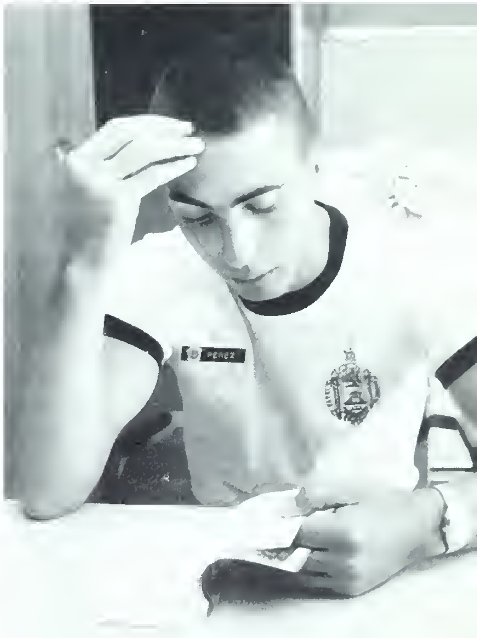
WILSON '88

Counseling Services and Programs

The Division of Professional Development offers a range of counseling services and programs. In addition, a student counseling center with a staff of doctoral-level psychologists is available to help with adjustment, developmental, interpersonal, academic, vocational, and stress-related problems. Programs for tension control, weight control, alcohol education, and certain physical education deficiencies are also offered. And, finally, a learning center offers help with management of time and with reading, writing, and study skills.

Medical and Dental Care

The finest medical and dental care is available to midshipmen. Facilities in Bancroft Hall are modern and convenient. Daily sick calls, specialty consultations, and periodic physical and dental examinations help midshipmen stay in excellent health. If hospitalization is necessary, midshipmen are sent to the Naval Hospital in nearby Bethesda, Maryland.



"The only problem here is that you don't have the freedom to get up and go when you want to. But freedom is in the mind, anyway. I love it here."

Legal Assistance

Professional legal counsel and assistance is available to midshipmen from legal officers (attorneys) attached to the Academy's Office of Legal Counsel in Mahan Hall. The office, a detachment of the Naval Legal Service Command in Washington, D.C., insures accessibility and independence of counsel to assist midshipmen with their legal questions as well as with administrative needs.

Financial Advice

Midshipmen are given financial advice on matters relating to savings, loans, insurance programs, and estate planning throughout their four years at the Academy. This is accomplished through lectures at company and battalion levels and through individual counseling as needed. The Midshipmen Financial Advisor is a Navy Supply Corps officer, and his office is in Bancroft Hall.

CHAPTER 4

The Naval Profession

Ours is a complex naval service. U.S. Navy ships range every ocean, employing some of the most advanced technology in existence and visiting ports in more than 50 nations. Navy submarines patrol the oceans' depths for months at a time, silent and self-sufficient thanks to their sophisticated nuclear propulsion systems. Naval aircraft, ranging from helicopters and multi-engine patrol planes to supersonic jet fighters, fly around the clock from naval air stations, aircraft carriers and smaller ships. U.S. Marines serve in Navy ships and at posts in the United States and abroad, carrying on the Marine Corps traditions of readiness and valor.

As complicated and technology-oriented as the naval service is, the people in the Navy and Marine Corps are the all-important factor. Thus, the naval profession puts a higher premium on leaders with vision, dedication, and ability. The profession offers those leaders a calling with a proud past and a promising future, broad enough to present stimulating challenges in a spectrum of career fields.

After four intensive and demanding years of academic studies and professional training at Annapolis, Naval Academy graduates are fully ready to assume the leadership responsibilities of an officer in the greatest Navy or Marine Corps in the world. Every physically qualified graduate is commissioned in the unrestricted line of the Navy or the Marine Corps. Those physically ineligible to accept these commissions apply for commissions in a Navy staff corps or restricted line specialty. Whatever the initial operational duty, officers usually find the responsibilities assigned are greater than those of their contemporaries in civilian life.

First Duty

A Naval Academy graduate's first career opportunity comes with the initial choice of duty. Midshipmen make this selection about four months before graduation. Service selection is based on individual duty preferences, class standing at the Academy, and personal qualifications. Every attempt is made to assign graduates to the duty and locality they request, subject to the needs of the service. The career options available — on land, sea, under the sea, and in the air — are by far the broadest offered by any of the service academies:

Surface Warfare—Those midshipmen selecting the surface warfare specialty choose their initial duty assignment from a list containing virtually

"Of all careers, the Navy is the one which offers the most frequent opportunities to junior officers to act on their own."

Napoleon

every type of surface ship in the U.S. Navy, ranging from minesweepers and destroyers to amphibious and service force ships and aircraft carriers. Graduates attend the four-month course of instruction at the Surface Warfare Officer School (SWOS) in either Newport, Rhode Island, or Coronado, California, before reporting aboard for their initial 30-month Division Officer tour. During this first duty, the newly commissioned officers will hone their skills in a challenging qualification process resulting in their designation as Surface Warfare Officers, with the privilege to wear the "SWO Pin."

Submarine Force—Those qualified midshipmen who select a career with the submarine force complete the year-long nuclear propulsion training pipeline prior to attending Submarine School in New London, Connecticut, for three months. Upon completion of Submarine School, officers report to their first attack or fleet ballistic missile submarines for an initial 36-month tour of duty. Newly reported division officers then experience a rigorous qualification process earning the silent service's "Gold Dolphins".

Nuclear Propulsion—Within the areas of surface warfare and submarines, midshipmen in their senior year have the opportunity to select a sub-specialty in nuclear power following graduation. Candidates selected undertake six months of study at the Nuclear Power School, Orlando, Florida, followed by six months of training at one of three nuclear reactor prototype sites in Idaho, New York, or Connecticut. Completion of the year's training leads to eventual assignment in a nuclear-powered surface ship or submarine. Midshipmen who aspire to duty in one of these ships can acquire a strong foundation by majoring in engineering, science, or mathematics. Judicious choice of elective courses in the scientific and technical areas also improves the chance for the humanities major to be selected into the program.

Navy Aviation—Graduating ensigns who choose Navy aviation as either pilots or naval flight officers report to Pensacola, Florida, for basic flight training. Upon completion of the initial phase, pilots move on to Meridian, Mississippi; Corpus Christi, Texas; Kingsville or Beeville, Texas, depending upon the type of aircraft (jet, prop or helo) in which they will specialize. Naval flight officers remain in Pensacola for the completion of their training. This 18- to 24-month process culminates in qualification in naval aviation and the right to wear the "Wings of Gold." After designation as naval aviators or naval flight officers, the officers next report for a three- to four-month tour in a replacement air group for indoctrination in the specific aircraft they will be flying. Then the new, fully qualified naval aviators report to their first squadrons, usually for 36-month tours of duty.

Marine Corps—One out of every six Annapolis graduates may volunteer for appointment in the Marine Corps as a second lieutenant. Those accepting commissions in the Marine Corps will spend 23 weeks at the Basic School—a school for officers, run by officers. This school provides a common background in the tactical study of land warfare, enabling both air officers and ground officers to join Marine Air/Ground task forces with Marines as light infantry capable of opposing much heavier-equipped forces. This meshing of air and ground officers allows both the opportunity for overall command at the highest level of combined units, not just within their career specialties. After this familiarization training, Marine lieutenants receive formal training in the occupational specialty they are qualified for and choose. Career field choices include those in the two basic categories of ground and air. For example, ground career choices include infantry, armor, artillery, logistics, engineers, data processing, and communications.

USMC
NFO (USN)
PILOT (USN)
GEN URL

Aviation career choices include pilot, naval flight officer, air command and control, anti-war warfare, aviation maintenance, and aviation supply. Upon completion of their extensive career training, Marine lieutenants are assigned to leadership billets in regular Marine Corps units.

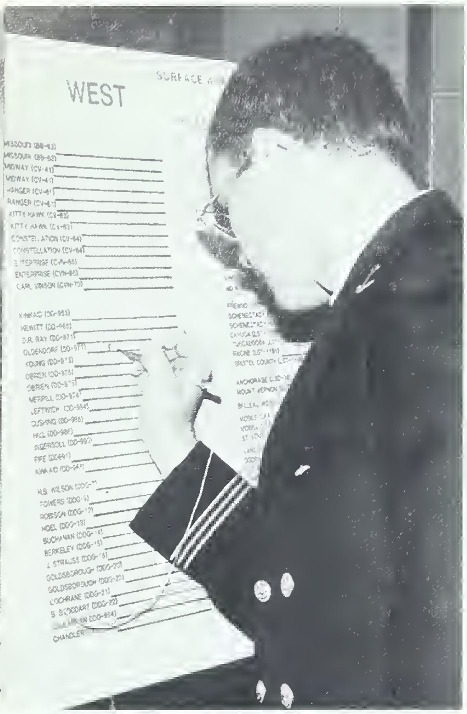
"The first essential of a successful military leader is to be able to understand and comprehend the emotions and the spirit which live in the hearts and souls of the men he commands."

Major General
John A. LeJeune, USMC
Class of 1888

Assignments for Women Officers

Congressional legislation has amended the long-standing law that prohibited women from serving onboard Navy ships or aircraft that are or could be engaged in combat missions. Law now permits women to serve as members of ship's company on a variety of auxiliary ships (repair ships, research vessels, salvage ships, replenishment vessels) which do not *normally* perform a combat mission. Women officers are eligible for temporary duty assignment (less than 180 days) to *any* ship for which a combat mission is not envisioned during the temporary duty period.

Nevertheless, even though this significant change will allow women to go to sea in increasing numbers, the career patterns and duty stations of women graduates of the Naval Academy are still different from their male counterparts. The limited number of non-combat related sea billets means that women, in general, may expect the majority of their assignments to



"But the best experience I've had is in leadership. I know I can motivate people, set priorities, and handle the pressure—because I've done it."

be ashore. So, although a percentage of women officer graduates from the Naval Academy go to sea or fly a plane as surface and air warfare specialists, the majority of women officer graduates will develop other specialties and pursue careers (occasionally at sea) in such areas as administration, communications, computer science, engineering, oceanography, intelligence, and research and development.

Women accepting a commission in the Marine Corps may be assigned to any duty available to male officers with the exception of those which may place them in a combat situation (infantry, artillery, tanks, combat flying, etc.). Some of the occupational specialties available to women marines include supply, adjutant (administration), communications, disbursing, public affairs, law, data systems (computers), and air control.

Recent Service Selection Distribution

The principal duty assignments for the 1046 (970 men, 76 women) members of the Class of 1985 commissioned in the U.S. Navy and Marine Corps following graduation included the following:

Surface Warfare: 251 men, 10 women
Nuclear Power Training: 193 men (149 submarine-bound, remainder to surface ships)
Navy Aviation: Pilot training—200 men, 6 women; Flight Officer training—86 men, 3 women
Marine Corps: 174 men, 10 women

USS SAMPLE
USS RANGER CV-61
USS SCHENECTADY
AFS-7

COLOR CODE
NORFOLK
MAYPORT
CHARLESTON
LITTLE CREEK
OTHER
MCINERNEY
S.W. GROVES FFG8
S.W. GROVES FFG29
KAUFFMAN FFG29
KAUFFMAN FFG59
FFG59
CHARLESTON LKA113
CHARLESTON LKA113
EL PASO LKA117
EL PASO LKA117
RALEIGH LPD1
AUSTIN LPD4
PONCE LPD15
GUAM LPH9
GUADALCANAL LPH7
INCHON LPH12
BOULDER LST119
FF1056
FF1059
FF1068
FF1068
FF1078
FF1079
FF1080
FF1081
FF1085
FF1085
FF1082
FF1082
FF1089
FF1091
FF1092
FF1093
FF1094
FF1095
FF1096
FF1096
FF1097
PYRO
HALEAKALA AE24
MOUNTHOOD

"It was the Academy's total person concept. I couldn't imagine myself at home, going to college, just getting a degree, never going anywhere or doing anything."

One hundred and nine midshipmen (85 men, 24 women), including midshipmen not physically qualified for the unrestricted line duties above, elected such fields as cryptology, engineering, administration, communications, intelligence, supply, aviation maintenance, special warfare, salvage and rescue, geophysics, and medicine.

Postgraduate Education and Training

Postgraduate programs leading to advanced degrees are available to a small number of officers immediately after graduation from the Academy. Other special programs follow initial tours of duty.

Upon graduation and commissioning, new officers may lay their books aside momentarily, but their theoretical and practical education will continue as long as they are in the service. They will prepare for assignments of greater responsibility and strive for professional attainment by acquiring practical experience ashore and afloat, and through advanced academic work. Their achievement is limited only by ability, initiative, energy, and resourcefulness, along with good career planning and performance.

Navy functional and technical courses provide the initial post-commissioning training for many officers. The duration and complexity of these courses differ, but all are taught at graduate level. They vary from the eighteen months of flight training for pilots to two- and three-week functional schools in damage control, communications, electronics maintenance, and antisubmarine warfare. These curriculums afford some exceptional educational opportunities. For example, graduates selected for the nuclear power training program receive the finest technical preparation in this field found anywhere in the world.

After the first tour (two to four years) of operational duty with the Fleet, many qualified Naval Academy graduates receive orders to graduate study for one or more years. Opportunities for graduate work continue throughout an officer's career. Military service colleges, in particular, are noted for their educational programs in the fields of management, economics tactics, international relations, and global strategy.

Appendix F describes graduate education programs in more detail. Included are programs designed exclusively for selected Naval Academy graduates.

Officer Career Patterns

Within the framework of the needs of the service, officers determine their own career patterns to a significant degree through their requests for assignments and advanced studies, as well as through personal performance. After the initial tour, most young officers have a fairly well-developed idea of what career pattern they would like to pursue. Line officers seek operational assignments that will prepare them for command of a surface ship, submarine, aircraft squadron, or Marine combat unit. Tours of duty ashore come at regular intervals. Officers aspiring to command at sea will serve in a number of ships or aircraft squadrons in different capacities, and in staff and planning billets, afloat and ashore, in the United States and overseas.

Graduate studies and repeated assignments in specialized field lead to subspecialties which include such varied fields as ship engineering, aero-

OKINAWA
SALERNO

nautical engineering, management, international relations, and personnel administration.

It is at once a satisfying and demanding life. The officers in the Navy or Marine Corps present many faces to the world as they advance in seniority: professional sailor, Marine, aviator, engineer, manager, scientist, administrator, educator, diplomat, Fleet commander. This is not just a job, but a way of life—a career which rewards the industrious, the loyal, and the imaginative. It is a career for those with a zeal for strenuous living, patriotism, and dedication to an ideal of real meaning which can be translated into a lifetime of opportunities and adventure in the Navy or Marine Corps of the United States.

"The opportunities here are unlimited. You can do as much and as many things as you want."

CHAPTER 5

Admissions

Each year, the Naval Academy's Admissions Board selects approximately 1,300 candidates for the plebe (freshman) class. They come from every state in the union and from all the varied backgrounds of American life. The Naval Academy encourages this diversity and recognizes the value of a Brigade enriched by members of every race, creed, and culture found in this nation.

Students from miniority groups are strongly encouraged to apply for admission. The number of miniority students in recent entering classes has risen sharply; 220 midshipmen in the Class of 1989 (about 16 percent of the class) were miniorities.

There are four general eligibility requirements for all candidates. Candidates must be of good moral character. They must be at least 17 years of age and not yet 22 years of age on July 1 of the year of admission. They must be unmarried, not pregnant, and have no dependent children. Finally, except for the limited quotas of foreign midshipmen specifically authorized by Congress, candidates must be citizens of the United States.

Prospective candidates who meet these requirements then must obtain a nomination; qualify scholastically, medically, and in physical aptitude; and be selected for entry. Scholastic qualification and selection is determined by the Naval Academy Admissions Board based on the candidate's school transcript and rank in class, SAT or ACT scores, school officials' recommendations, extracurricular activities record, and other evidence of character and leadership potential.

High School Program

Those interested in the Naval Academy should pursue studies in high school that will prepare them for a rigorous college program. The *quality* of the work is important. Seniors who stand below the top 40 percent of their high school class have limited chances for admission. In fact, 82 percent of the members of the class of 1989 ranked in the top 20 percent of their high school classes.

While the Academy does not have rigid requirements concerning the subjects which must be included in the school record, candidates are *strongly*

encouraged to include the following subjects in their high school or prep school curriculum:

mathematics—four years, including trigonometry, **English**—four years, **modern foreign language**—a minimum of two years, **European** or **world history**—one year, **chemistry**—one year, **physics**—one year.

About 100 members of each plebe class finish one or more semesters of college prior to admission to Annapolis. They may earn advance placement in their course of study. Applicants must furnish transcripts of any college work they have taken. Again, the *quality* of the work is important. All students must enter the Academy as plebes, and complete four-years of education and training.

"I believe that the principles and precepts embodied in the honor code here at the Naval Academy are sound as a guide in the years ahead. They are time-tested, and will help us make the difficult choices that lie ahead in our personal and professional lives."

Congressman John McCain
Class of 1958

Candidate Guidance

The Candidate Guidance Office in Leahy Hall at the Naval Academy counsels young men and women who are interested in an appointment to the Naval Academy. This office also coordinates the nationwide activities of the Naval Academy Information Program. The Naval Reserve officers and civilians who are members of this program are qualified to counsel applicants on all aspects of admission and are in close contact throughout the year with officials at the Academy. Appendix E lists the State/Area Coordinators of this program. After reading this catalog, applicants who have questions about the Academy or its admission procedures should write to the coordinator nearest them, or to:

Director, Candidate Guidance, Code 304
U.S. Naval Academy
Annapolis, Maryland 21402–5018
Phone: 1–800–638–9156

Candidates living near the West Coast may write:

Mr. Tom Teshara
USNA Office
NAS Moffett Field, California 94035–5017
Phone: (415) 966–5931

The Naval Academy itself is open to visitors from 9 a.m. to 5 p.m. or dusk (whichever is later) daily. Tours leave frequently from the Visitor's Center in Ricketts Hall. The admissions office does not give tours, but prospective candidates are encouraged to drop by the Academy's Candidate Guidance Office in Leahy Hall to talk with an officer counselor from 8 a.m. to 5 p.m. Monday through Friday, and from 8 a.m. to noon on Saturday. No appointment is necessary.

"I visited the Academy and almost changed my mind about coming. Being a plebe looked like too much to put up with. Now I'm glad I came. I'm learning a lot about myself."

Candidate Visitation Programs

Two visitation programs are designed to help candidates make more informed decisions about entering the Academy:

Bancroft Hall Candidate Visitation Program. From November through April, candidates who are likely to be offered an appointment to enter the Academy are invited to spend part of a weekend with the Brigade of Midshipmen. During this visitation period, which begins at 8 a.m. Friday and continues until 6:30 p.m. Saturday, candidates attend classes, eat meals, live in Bancroft Hall, and follow the routine of midshipmen escorts.

Academy Information Day. An informative program, similar to the weekend Bancroft Hall visit but limited to one day, is held in February at the Academy. Candidates are invited to meet with the Superintendent, Commandant, and admissions representatives.

"Every night when you go to bed, you're glad you made it. You have to take it one day at a time . . . keep your chin up, keep smiling. Because someday you won't be a plebe anymore."

Precandidate Questionnaire

Applicants should submit a Precandidate Questionnaire to the Naval Academy in the late spring of their *junior year*, or as soon thereafter as practicable. The Academy will open a preadmission file upon receipt of this questionnaire, and an initial evaluation will be shared with the applicant. Information in this file also will be used by the Academy to give the applicant's Representative and Senators with periodic status reports, which include an evaluation of the applicant, the results of the medical examination, and other information which may assist the applicant in being selected for a Congressional nomination. The Precandidate Questionnaire should be requested from the Director, Candidate Guidance (Code 304), U.S. Naval Academy, Annapolis, Maryland 21402–5018.

Tests

Either the College Entrance Examination Board (CEEB) Scholastic Aptitude Test (SAT) *or* the American College Testing Program (ACT) test is required of each candidate. These tests may be taken any time they are offered until February of the year of admission to Annapolis. Students interested in applying for admission are strongly urged to take these tests (in addition to the PSAT) in their *junior* year to help the Naval Academy and members

of Congress make an early evaluation of their candidacy. The *average* of all SAT/ACT test scores for tests taken *after* December of the junior year are used by the Naval Academy in evaluating a candidate's scholastic qualifications for admission.

The college code numbers 5809 for the SAT and 1742 for the ACT should be used to forward test scores to the Naval Academy. This request is normally made at the time the tests are taken, but can be made later. If the scores are recorded on the high school transcript, they will be accepted as official scores if the transcript is validated by and sent directly from the school.

Candidates interested in advanced placement (validation of courses) at the Academy are encouraged to take advanced placement courses in high school and the appropriate College Board Advanced Placement tests (May) and the English Composition Test *with* Essay (offered in December *only*). Neither Advanced Placement Tests or CEEB Achievement Test scores are considered by the Academy in determining scholastic qualifications for admission.

Test Dates for Candidates for the USNA Class of 1991
(Registration deadlines are in parentheses)

CEEB/ATP	ACT
Jan. 25 (Dec. 20) 1986	Feb. 8 (Jan. 10) 1986
Mar. 15 (Feb. 7) 1986	Apr. 12 (Mar. 14) 1968
May 3 (Mar. 28) 1986	June 14 (May 16) 1986
June 7 (May 2) 1986	Oct. 25 (Sept. 26) 1986
Oct. 11 (Sept. 19) 1986*	Dec. 13 (Nov. 14) 1986
Nov. 7 (Oct. 2) 1986	Feb. 7 (Jan. 9) 1987**
Dec. 5 (Oct. 30) 1986	
Jan. 23 (Dec. 18) 1987**	

* Limited states.
** Last SAT/ACT which may be taken for USNA Class of 1991.

Arrangements to take the SAT or ACT tests can be made through high school guidance counselors or by writing directly to the College Entrance Examination Board, Box 592, Princeton, New Jersey 08541, or 1947 Center Street, Berkeley, California 94704; or to the Registration Department, American College Testing Program, P.O. Box 414, Iowa City, Iowa 52243.

"I really felt strange after becoming a qualified marksman, knockabout sailor, motor launch operator, and yawl crew member in my first 45 days. And it was all free. What civilian college could offer me that?"

Obtaining a Nomination

All applicants *must* have a nomination from an official source in order to be considered by the Naval Academy for appointment as midshipmen. There are many sources of nominations. Applicants should apply to *all* sources for which they are eligible. This always includes a U.S. Representative, two U.S. Senators, and the Vice President. Although nominations are not due to the Academy until January 31, many members of Congress evaluate candidates during the summer months and some nominate in early fall. Therefore applicants should apply for Congressional nomination during

"It's nice to have a little discipline in your life. I owe a lot to this place."

the spring of their junior year in high school. Applicants for military-service-connected nominations (as described in paragraphs following) should apply directly to the Naval Academy for that nomination after July 1 of the year prior to admission. All but a few candidates will be notified of their nomination status by the end of February of their senior year. Nomination sources include:

U.S. Senators, Representatives, the Delegate to the Congress from the District of Columbia, and the Resident Commissioner of Puerto Rico. Each may have five midshipmen attending the Academy at any one time. Ten nominations may be made for each vacancy. It is not *necessary* to know the official personally. Candidates should apply directly to their two U.S. Senators and to the Representative from their Congressional district. Appendix A gives sample letters of application.

The President. Presidential appointments are available to 100 midshipmen each year. These competitive appointments are limited by law to children (if adopted, must have been adopted prior to age 15) of *career* officers and enlisted personnel of the armed forces, including Coast Guard, who either (1) have been serving *continuously* on active duty for at least eight years, and still serving, *or* (2) who are retired with pay (*other* than those retired under Section 1331 of Title 10, USC—retirement at age 60 for combined active and inactive service of at least 20 years). Application should be after July 1 and before February 15 to the Superintendent, U.S. Naval Academy (Attn: Nominations and Appointments Office), Annapolis, Maryland 21402-5019. Appendix A includes a sample letter of application which explains required documents.

The Vice President may have five midshipmen nominated from the United States at large attending the Academy at any one time. This nomination is *very* competitive. Application should be made no later than November 1 to the Office of the Vice President, Washington, D.C. 20501. Appendix A shows sample letters of application. No correspondence (i.e. high school transcripts, supporting letters) should be sent to the Vice President's Office. This material should only be sent to the Admissions Office, U.S. Naval Academy (ATTN: Vice Presidential Applicant), Annapolis, Maryland 21402-5017.

The Governor of Puerto Rico, the Administrator of the Panama Canal Zone, and the Delegates to Congress from Guam, the Virgin Islands, and American Samoa. Puerto Rico, the Panama Canal, and Samoa each may have one nominee in attendance. Guam and the Virgin Islands each may have two nominees in attendance. There are ten nominations for each vacancy, and residency is required. Apply to the appropriate official.

"Be in good physical condition. Know what you are getting into. Don't expect everyone to like you. Realize that you always have to prove yourself. Be ready to sacrifice; it is not all meant to be fun."

Regular Navy and Marine Corps. Eighty-five appointments are authorized each year. Completion of one year of service determined from Pay Entry Base Date (PEBD), by July 1 of the year of induction as a midshipman is required. Application must be made via the applicant's commanding officer for his endorsement. Consult OpNavInst 1531.4D or Marine Corps Order 1530.11E for instructions.

Naval and Marine Corps Reserve. The applicant must be on active duty or a member of a drilling unit, and have served in the reserve for one year, determined from Pay Entry Base Date (PEBD), by July 1 of the year of induction as a midshipman. There are 85 appointments each year. Apply through the commanding officer in accordance with OpNavInst 1531.4D or Marine Corps Order 1530.11E.

Naval Reserve Officers' Training Corps (NROTC & NJROTC/MCJROTC). There are ten appointments each year. Application must be made by applicant's professor of naval science or senior military instructor.

Honor Naval and Military Schools. Three nominations may be made annually by the headmaster of each approved honor preparatory school. Nominees compete for ten appointments. Apply through the headmaster.

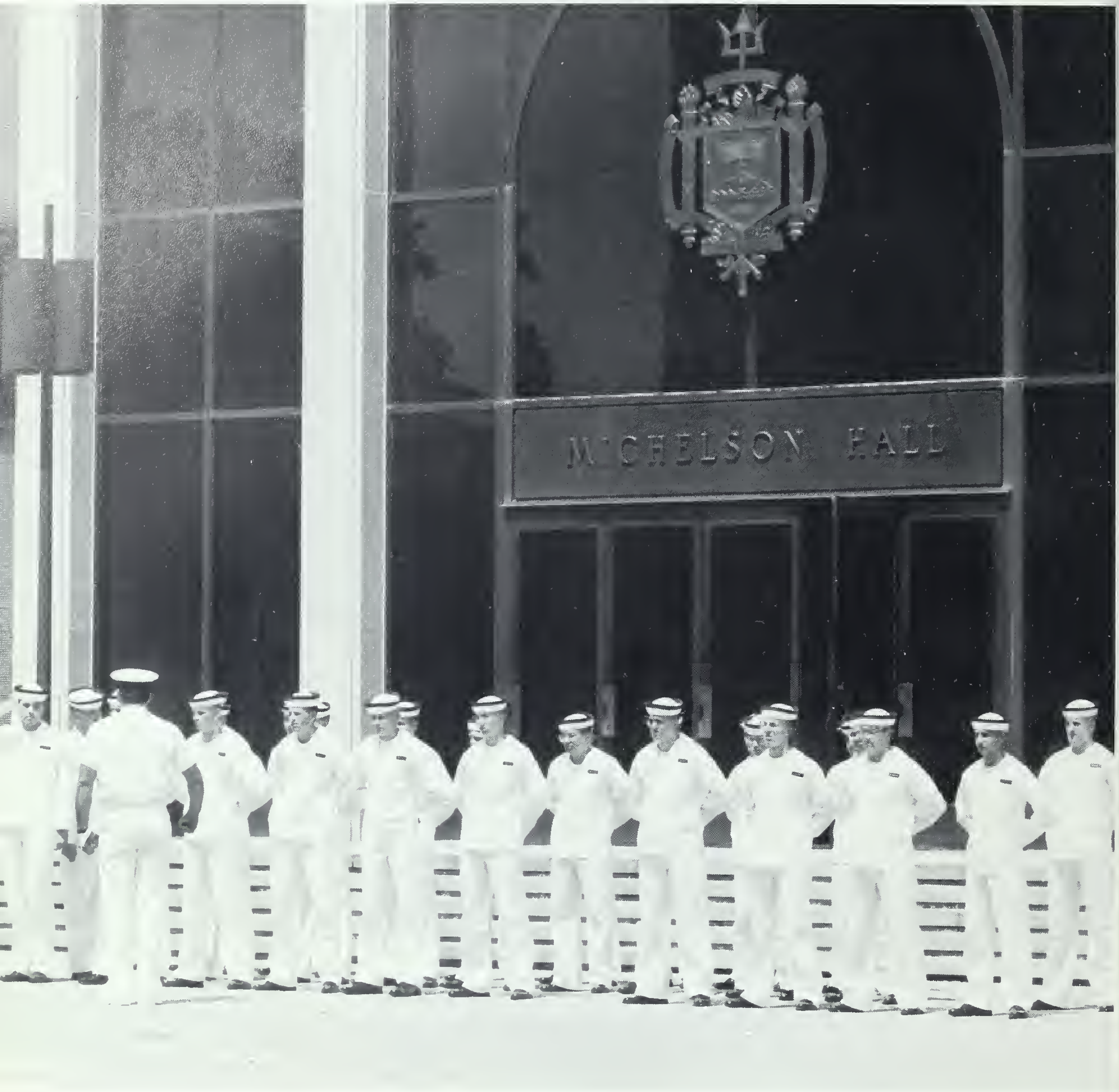
Children of Deceased or Disabled Veterans and Children of Prisoners of War or Servicemen Missing in Action. Eligibility is limited to children (if adopted, must have been adopted prior to age 15) of armed forces members who were killed in action; who died from wounds, injuries, or disease while on active duty; who sustained 100 percent disability (as certified by the Veteran's Administration) from such wounds, injuries, or disease; and children of servicemen who are currently prisoners of war or missing in action. The children of civilians in a POW or MIA status are also eligible. A maximum of 65 appointees may be at the Academy at any one time. Applicants should write to the Superintendent, U.S. Naval Academy (Attn: Nominations and Appointments Office), Annapolis, Maryland 21402–5019.

Children of Medal of Honor Winners. There is no limit on the number of appointments in this category. Application should be made to the Superintendent, U.S. Naval Academy (Attn: Nominations and Appointments Office), Annapolis, Maryland 21402–5019.

Sample letters for requesting nominations appear in appendix A. Foreign students should refer to appendix C.

Congressional Nominating Procedures

Each member of Congress may have five midshipmen attending the Naval Academy at any time. Whenever a vacancy occurs due to graduation or attrition, the member may then nominate ten candidates to fill that vacancy.



"Parents' Weekend was a very strange experience. My parents were so excited about seeing me after 6 weeks that they took a whole roll of film. Of the wrong plebe."

Bob Poor
Class of 1985

Members of Congress may, at their discretion, use any of the following three nominating methods: Nominees may be designated as "principal," 1st alternate," "2nd alternate," and so on to "9th alternate"; they may be nominated as a principal with nine competitive alternates for ranking by the Naval Academy; or they may simply be nominated as a slate of ten competitors to be evaluated and ranked by the Naval Academy for the vacancy.

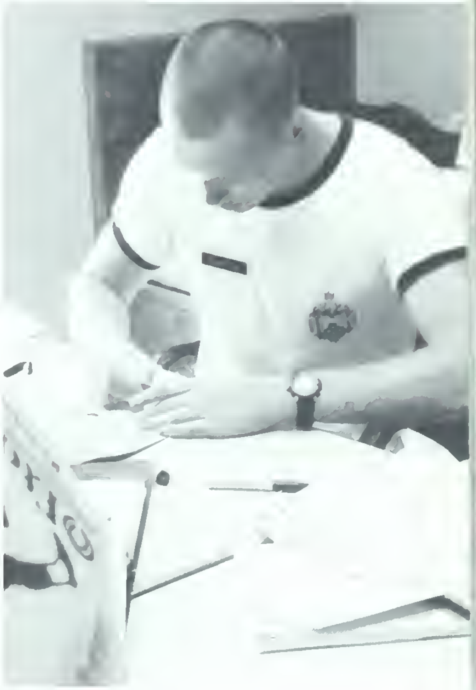
Whatever Congressional nominating method is used, the highest-ranking candidate on the list who is found to be completely qualified for admission by the Academy is appointed to fill the vacancy. This does not mean that the other nine nominees are no longer considered. In fact, it is possible that some or all may be selected for admission as qualified alternates.

Admission of Qualified Alternates and Competitors

Each year the Naval Academy selects for admission *several hundred* qualified Congressional-type alternate nominees (including Vice Presidential, Samoa, Guam, etc.) and competitive nominees (Presidential, Regular Navy and Marine Corps, NROTC, etc.) to bring the size of the entering class up to authorized strength. By law, the first 150, plus three-fourths of any others so appointed, must be Congressional-type nominees. No special application for these additional appointments is necessary, since *all* qualified nominees are considered *automatically* by the Academy's Admissions Board.

Admission of Women

In meeting the "needs of the service" for women officers, the Naval Academy will be authorized by the Navy to admit about 125 women in the Class of 1991. More than 1,600 women applied for the Class of 1990. Women compete for the same nominations as do men. The number of women who may be appointed from each of the existing sources of nominations is proportional to the total number of appointments authorized by law for these sources. Women at the Naval Academy have meshed well with their male counterparts and have succeeded in every facet of Academy life. In 1984, for the first time in the history of the service academies, a female midshipman graduated first over-all in the class.



"The Academy is the only place I know which pushes each midshipman to his absolute mental and physical limits. Although I've had my back against the wall, the Academy taught me to bounce back. That's when I started feeling good about the Academy and myself."

Kennon Artis
Class of 1988

Previous Candidates

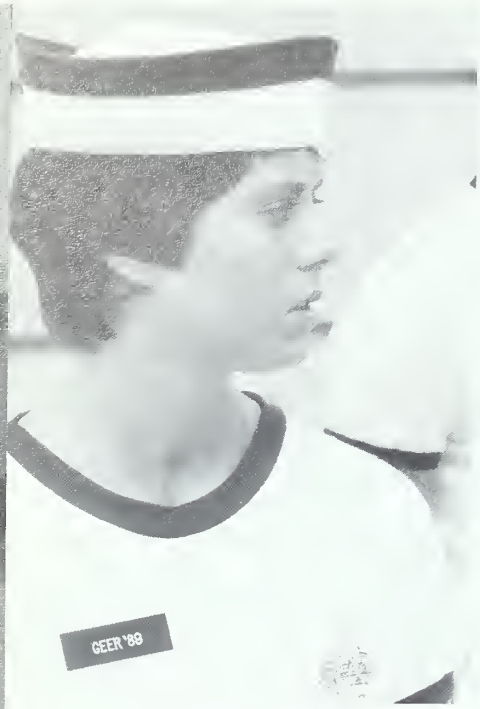
Unsuccessful applicants for a previous entering class may reopen their admissions files for a subsequent class by submitting a new Precandidate Questionnaire. Applicants must obtain a new nomination to be considered for admission, and they must continue to meet general eligibility requirements regarding age, marital status, etc. Retaking of SAT/ACT tests is highly recommended. Additionally, for best advantage, any college or junior college work taken by candidates should include a curriculum similar to that of first-year midshipmen (i.e., a full academic schedule including math, science, and English).

Readmission of Former Midshipmen

To be eligible for readmission, a candidate must *not* be past his or her 26th birthday on July 1 of the expected year of graduation from the Academy. In addition to obtaining a new nomination and completing the other normal admission requirements, the Naval Academy's Academic Board must approve the readmission of former midshipmen. Requests should be addressed to the Dean of Admissions not later than April 1.

Medical Examination

All candidates must pass a very thorough medical examination. This examination is designed to ensure that they have the physical and mental fitness necessary to carry out the rigorous demands of the Naval Academy program. Physically fit candidates in good health with normal vision seldom have difficulty in passing the examination. Candidates should carefully



"Would advise any high school student who is considering the Naval Academy to take a lot of math and science courses."

review the detailed medical standards contained in appendix B. Candidates having less than 20/20 uncorrected vision should note the special examination requirements for those who wear eyeglasses or contact lenses in the Eyes and Vision section of appendix B. Persons with defective color vision *cannot* be admitted.

All candidate medical examinations are scheduled by the Department of Defense Medical Examination Review Board. This agency is responsible for scheduling and evaluating candidate medical examinations for all of the U.S. service academies. The Naval Academy determines the *priority* of medical scheduling for Academy candidates. This is necessary because of the limited capacity of examining facilities available throughout the nation. For some candidates, this means that they will not be scheduled for a medical examination until they are found to be otherwise fully qualified for admission and in line to be considered for an appointment.

The Physical Aptitude Examination

Candidates must also pass a Physical Aptitude Examination to qualify for entry. This examination tests coordination, strength, speed and agility. It consists of four tests: pull-ups (men) or flexed arm hang (women), and a standing long jump, a kneeling basketball throw, and a 300-yard shuttle run. This examination is conducted separately, and is not part of the medical examination.

Complete details of this examination are given to candidates by the Naval Academy, along with a testing form and instructions for conducting the examination. It may be administered by a teacher or school official holding a degree in physical education or by any commissioned officer on active duty.

Beyond this test requirement, candidates are *strongly* advised to be in the best possible physical condition when they enter the Naval Academy in early July. The first summer is *very* demanding physically, starting with the very first day. Endurance and upper body strength are particularly important. Cross-country runs, weightlifting, isometric exercises, swimming (ability to swim at least 100 yards and to tread water or float for 20 minutes), push-ups, and pull-ups, and (for women) the flexed-arm hang are valuable conditioning exercises.

Notification of Qualification and Selection for Appointment

All candidates holding official nominations are notified of their qualification status by April 15. Offers of appointment are made on a continuing basis from mid-October to June. Fully qualified candidates who have not been offered an appointment by May 1 probably will not be selected. All candidates who have been offered an appointment to the Naval Academy with the entering class will have the opportunity to visit the Academy in mid-May for a full day of orientation briefings and tours. The new class is admitted in early July.

Profile of an Entering Class

In a typical year, the Naval Academy receives more than 14,000 applications. About 6,500 applicants will receive official nominations, of which some 2,500 will be found qualified scholastically, medically, and in physical aptitude. Appointments as midshipmen will be offered to about 1,600 of

these, and some 1,300 will accept and become members of the entering class. SAT scores of the entering class will *average* about 1240 total with good balance between verbal and math; ACT will average about 56 total. Over 1,000 will have ranked in the top 20 percent of their high school class; perhaps 100 will have had at least a semester of college. Fifty will be children of alumni. The class will include some 125 women and perhaps 220 minority midshipmen, of which some 90 will be black, 40 will be Oriental-American, and 90 will have Hispanic backgrounds. Honors and activities will include: class or student body officers (20 percent); National Honor Society (55 percent); varsity letter winners (80 percent); dramatics, public speaking, and debating (55 percent); leaders of musical groups (8 percent); Eagle Scouts (7 percent); Boys/Girls State or Nation (17 percent); and JROTC, NROTC, AFROTC (7 percent).

"I'd advise anybody to come if I thought they could make it here and had an interest in becoming a naval officer. I'd say yes, come here vice going through an NROTC unit or OCS. I think I made the right decision. I really do."

Pay and Expenses

Midshipmen currently are paid $480 per month, commencing on the date of admission. This salary provides funds for uniforms, books, equipment, laundry, and income tax, as well as for personal needs while at the Naval Academy. Also, by graduation, midshipmen will have accrued savings averaging $1,500. Typically, this will be used to purchase additional uniforms and to help them get settled at their new duty stations.

Semper Fi
Marines Toughen Women's Training
Marines Firing HAWK
obra Unc
ptain Goes Dutch Treat With NATO Partners
MARINE CORPS

"What our military needs is men and women whose sense of honor allows them to make do with less, and whose sense of country transcends ethnic or family allegiance."

Vice Admiral
James B. Stockdale, USN (Ret.)
Class of 1947

Before admission as midshipmen, candidates each must deposit with the Midshipmen's Store the sum of $1,000 to be used in partial payment for uniforms and supplies. In cases of extreme hardship this sum may be reduced or waived. If this is necessary, money allowances are reduced until the individual's account reaches prescribed levels, and the midshipman's accrued savings will be less than the class average upon graduation.

The initial issue and the additional uniforms, clothing, textbooks, and expenses required the first year are valued at approximately $4,000. The deposit made at the time of entry is supplemented by an entrance credit of $1,500. This $1,500 credit is an interest-free loan advanced by the government to defray the cost of the uniforms and equipment required during the first year. Repayment of the indebtedness is accomplished by monthly deductions of $125 from midshipman pay, beginning in July of the second year at the Naval Academy and continuing until the indebtedness is liquidated.

Agreement to Serve Signed by Entering Midshipmen

As required by Title 10, U.S. Code, Sections 6959 and 2005, and other agreements, entering midshipmen who are citizens or nationals of the United States must sign an agreement (with the consent of parents or guardian if a minor) that they will:

1) Complete the course of instruction at the Naval Academy;

2) Accept an appointment and serve on active duty as a commissioned officer of the Regular Navy or Marine Corps for at least five years immediately after graduation;

3) Accept an appointment as a commissioned officer in the reserve component of the Navy or Marine Corps and remain therein until the eighth anniversary of graduation from the Naval Academy *if* an appointment as a commissioned officer in the regular component is not tendered at graduation or if such graduate resigns as a commissioned officer of the regular component before the eighth anniversary;

4) Serve in an appropriate enlisted grade on active duty for not more than four years if they do not fulfill the agreement in paragraphs 1–3 above;

5) Reimburse the United States for the cost of education received at the Naval Academy if they voluntarily or through misconduct fail to complete a period of active duty specified above.

"The Naval Academy gave me an opportunity to find out what I'm all about. Sometimes you really don't know who you are or where you are going in life. The Naval Academy is a good place to find out."

Service Obligation, Separations, and Resignations

Midshipmen entering the Naval Academy directly from a civilian status assume a five-year active-duty military obligation, as explained in the previous section. If midshipmen do not fulfill this Agreement to Serve, they may be transferred to the Naval or Marine Corps Reserve in an enlisted status and may be ordered to active duty for such a period of time as the Secretary of the Navy may prescribe but not for more than four years, as provided by Title 10, U.S. Code, Section 69596.

The following policies currently apply to midshipmen who enter the Naval Academy directly from a civilian status:

Fourth and third classmen (freshmen and sophomores): Any fourth or third classman who is separated, or whose resignation is accepted, will be discharged from the naval service.

Second and first classmen (juniors and seniors): A second classman who is separated or whose resignation is accepted prior to the beginning of the second class academic year (the first day classes formally convene for the fall semester) will be discharged from the naval service. Unless a midshipman is physically disqualified, unfit, or unsuited for military service in an enlisted status, a midshipman whose resignation is accepted or who is separated after the start of second class academic year, but prior to the start of the first class academic year, will serve two years in an enlisted status. After the start of first class academic year, the obligation is three years. If a midshipman graduates but refuses a commission, the obligation is four years of enlisted service.

Midshipmen entering the Naval Academy from the regular or reserve component of the Navy or Marine Corps, including midshipmen entering from the Naval Academy Preparatory School, will not have their enlistment or period of obligated service terminated because of the acceptance of a midshipman appointment. If such a midshipman is separated from the Academy or has a resignation accepted prior to fulfilling the Agreement to Serve detailed in the preceding section, the midshipman will resume enlisted status and shall complete the period of service for which enlisted or obligated, as provided by Title 10, U.S. Code, Section 516. In computing the unexpired part of an enlistment or period of obligated service, all service as a midshipman is counted as service under that enlistment or period of obligated service. However, completion or partial completion of service

"Nothing here is easy for anyone, but nothing is so hard that it can't be done."

obligation acquired by prior enlistment in no way exempts a separated or resigned midshipman from being transferred to the reserve component and ordered to active duty, the same as a midshipman who enters the Academy directly from a civilian status, as provided by Title 10, U.S. Code, Section 69596.

An individual must complete any active duty obligation incurred either through disenrollment or by commissioning as described in the earlier paragraphs. Persons failing to complete the active duty obligation, either voluntarily or through misconduct, may be required to reimburse the United States for the cost of education received at the Academy. The cost of education is computed by the Naval Academy and includes the costs of professors' salaries, supplies, and other expenses. It is comparable to the tuition at a first-rate private civilian university.

The amount to be reimbursed varies proportionally with the period of unserved obligation. If a former midshipman serves none of the active obligation, voluntarily or through misconduct, he or she may be required to reimburse the entire cost of education. If the midshipman completes part of the obligation, the amount which must be reimbursed will be reduced proportionally.

Preparatory Scholarship Assistance

The U.S. Naval Academy Foundation, Inc., is a tax-exempt, nonprofit organization which offers deserving high school graduates an education assistance program to enhance their qualifications for admission to the Naval Academy. The Foundation is chartered for educational purposes under the laws of the State of Maryland. The Foundation's program is authorized and approved by the National Collegiate Athletic Association, and its aims are fully supported by the Superintendent of the Naval Academy.

The Foundation awards a limited number of post-high school preparatory scholarships annually to young men and women seeking admission to the Naval Academy to prepare for a career in the Navy or Marine Corps. Cash grants for these scholarships are made to participating junior colleges and preparatory schools or to a college selected by the applicant. Parents of young men and women selected for this program are expected to contribute financially within their capabilities.

Scholarship applications should be made to the Executive Director, U.S. Naval Academy Foundation, Inc., 25 Maryland Avenue, Annapolis, Maryland 21401–9979. Applications should be received by April 1 each year, although a limited number of later applications can be considered.

Participation in The Foundation's Scholarship program brings no guarantee of a nomination or admission to the Naval Academy. However, entering classes typically include about 100 Foundation "alumni."

Naval Academy Preparatory School

The Naval Academy Preparatory School, located in Newport, Rhode Island, has prepared servicemen for entry into the Naval Academy for more than half a century. Enlisted men and women study at the school from August to May. About one-fifth are from the regular Navy and Marine Corps, with the remainder from the reserves.

The Preparatory School offers college preparatory work in mathematics, physics, chemistry, and English. Students with appropriate backgrounds and abilities are able to undertake more advanced work, including courses at the college freshman level. Military training, physical training, and intramural and varsity sports programs complete the school's program.

Candidates in a regular or reserve Navy or Marine Corps status who are not successful in obtaining an appointment to the Naval Academy are considered *automatically* by the Naval Academy for admission to the Preparatory School. No special request for this consideration is necessary.

Additionally, each year, the Naval Academy indentifies a number of the most promising and highly motivated of those civilian candidates who were not successful in gaining an appointment to the Naval Academy. Those selected are offered the opportunity to enlist in the Naval Reserve for the *express purpose* of attending the Preparatory School. Consideration for admission to the Preparatory School is automatic. No special request is required. Details concerning this program are available from the Director of Candidate Guidance (Code 304), U.S. Naval Academy, Annapolis, Md. 21401–5018.

"I was career motivated. I still am. To me it's a step up going to the Naval Academy . . . The biggest step to me is that I did it all on my own."

Questions and Answers

You may still have questions about admissions procedures, methods of obtaining nominations, qualification and selection for admission, and other basic information about the Naval Academy. The following are among those most often asked by prospective candidates. The answers summarize earlier sections and may help to clear up any doubts or misunderstandings you may have.

Q. *Who can become a midshipman?*

A. Admission is open to young men and women of good moral character, without regard to race, creed, or national origin. Candidates must be citizens of the United States, unmarried, not pregnant, and have no dependent children, and be at least 17 years of age but not past their 22nd birthday on July 1 of the year of admission.

Q. *What must I do to become a midshipman?*

A. Obtain a nomination, qualify scholastically [acceptable American College Testing Program (ACT) tests or College Entrance Examination Board Scholastic Aptitude Test (SAT) scores, acceptable secondary school record including college-preparatory work, top 40 percent of class, and meet prescribed medical and physical standards. Be selected for an appointment.

Q. *Where may I get detailed admissions information?*

A. Information may be obtained from the Naval Academy Information Officer in your area (see appendix E); from high school guidance counselors; from the USNA Office, NAS Moffett Field, California 94035-5017; or by calling (1-800-638-9156), writing, or visiting the Candidate Guidance Office (Code 304), Leahy Hall, U.S. Naval Academy, Annapolis, Maryland 21402-5018.

Q. *What service selections are available to women?*

A. Federal law allows women to go to sea in ships which do not normally perform a combat mission. Women aviators may also perform noncombatant flight duties, including the landing of aircraft aboard ships at sea. However, because of the limited number of non-combat related sea billets available, only a number of women unrestricted line officers will be able to select these billets.

When serving ashore, women unrestricted line officers develop sub-specialties and pursue careers in one of the many areas including communications, computer science, engineering, environmental science, legal, or research and

"I just wanted to see my parents. I felt almost complete isolation during that plebe summer. Parents Weekend is tremendous—you know, you just feel proud of yourself, what you've been through, and you want to show somebody."

"You have to want to come here. You can't just come to the Academy because your parents or someone else wants you to."

development, to name just a few. Most physically qualified women will be commissioned in the line upon graduation from the Naval Academy.

A few women graduates, including those not physically qualified for a line commission, have the opportunity to be commissioned in restricted line or staff communities such as the Supply Corps, Civil Engineer Corps, intelligence, and so on. As is the case with men, opportunities available to women at graduation are subject to current needs of the Navy. All Marine Corps occupational specialties are available to women officers except infantry, artillery, tanks, and flying.

Q. *I don't know my Congressman. How do I get a nomination?*

A. It is *not* necessary to know him personally. Apply to the representative of your Congressional district and to both of your U.S. senators by mail; your applications will be considered carefully. Each member of Congress may have five appointees attending the Academy at any one time. And each member may nominate up to *ten* candidates for each vacancy. All applicants will be considered for an appointment and every attempt will be made to assist highly qualified candidates in obtaining a nomination. The essential thing to remember is that, by law, you *must* have a nomination to be offered an appointment. Once you are nominated, you officially become a candidate and your record can then be evaluated by the Naval Academy on its merits. Even if you are not selected to fill a particular Congressman's vacancy, if you have a Congressional nomination, have a good school record and otherwise meet the basic entry standards, you will have an excellent chance to become a midshipman. Each year several hundred of the best qualified alternate Congressional nominees are appointed to the Naval Academy, as necessary, to bring the entering class up to authorized strength.

Q. *I'm in the Naval Reserve. Can I get into the Academy?*

A. Up to 85 enlisted reservists (Navy and Marine Corps), on active duty or member of drilling units, may qualify to enter the Academy each year through the reserves. See your career counselor for details.

Q. *If I am eligible for a Presidential nomination, should I also apply for a Congressional nomination?*

A. Yes. The more nominations you obtain, the better chance you will have for selection if you are found fully qualified.

Q. *Is it difficult to enter directly from high school?*

A. No. About seven out of ten midshipmen enter directly from high school. Of those who do not enter directly from high school, approximately 190 will enter from the Naval Academy Preparatory School, 80 from the Naval Academy Foundation's preparatory scholarship program, 60 from private preparatory programs, 84 from colleges, and 20 from the Fleet (Navy & Marine Corps).

Q. *My grades were about average, but I played in several sports and was student body president. Also, I had to work after school. Will these activities help me?*

A. Yes. Evidence of leadership ability and participation in extracurricular activites, including athletics, part-time jobs, and civic activities are considered in our evaluations.

Q. *Is physical preparation important?*

A. It certainly is! Aside from helping candidates to do well on the physical aptitude test, men and women alike should be as physically fit at entrance *as possible*, since the first summer is *very* demanding. Endurance and upper-body strength are particularly important. Cross-country runs, swimming, push-ups and chin-ups, and (particularly for women) the flexed arm hang are valuable conditioning exercises. *Be in shape!* Or be sorry.

Q. *I have a high IQ and am a straight-A student. Will most of my time be spent on military subjects, or may I take any electives, such as electrical engineering?*

A. From 23 to 38 percent (depending on the major selected) of the Academy's curriculum is devoted to professional military studies, but at the Academy you will complete at least 140 rather than 120 semester hours typical of most civilian colleges. There are many academic majors offered, from English to mathematics to physics to history. Advanced research projects are offered in these and many other areas.

Q. *What part of the medical examination gives the most difficulty to candidates?*

A. The eye examination. Visual acuity of 20/20 is required. However, a limited number of outstanding candidates may be granted waivers for visual acuity *if* the refractive error is not excessive and their vision is correctable to 20/20 with eyeglasses (*not* contact lenses). *No* waivers for defective color vision are granted. If within waiverable limits, and otherwise fully qualified for admission, you will be *automatically* considered for a waiver by the Academy's Admissions Board based on your overall record. Since only a limited number of nominees may be granted a medical waiver, the competition for the available

"But I decided to stay. My dad had a big part in it. He didn't pressure me; he just said it was a big decision, and I should decide carefully."

"I thought that this would be like any other college with just a little Navy thrown in. Boy, was I wrong!"

waivers is keen. It should be noted that *all* nominees within waiverable limits (and otherwise fully qualified), including principal nominees of members of Congress, must compete for these waivers.

Q. *I don't like sports. Do I have to try out for anything?*

A. If you really dislike sports, then the Naval Academy may not be the best school for you. Midshipmen are required to participate in athletics, either varsity or intramural, for the development of character, physical fitness, and competitive spirit.

Q. *How much does it cost to be a midshipman?*

A. Tuition, room and board, and medical and dental care are provided. In addition, midshipmen currently receive a montly salary of $480 for uniforms, books, and personal needs. Salary and the value of the daily ration allowance ($3.80/day) accrue to each midshipman's pay account while on leave. A $1,000 deposit is required on entry. The deposit may be reduced or waived (upon request) in the case of serious hardship.

Q. *How often may I visit home?*

A. During Christmas and spring leaves. In addition, month-long summer leaves are granted to the three upper classes. You must pay for your own travel.

Q. *How many flunk out?*

A. A comprehensive system of counseling, extra instruction, and grading period evaluations increases every midshipman's chance of academic success. Only about eight percent of each entering class eventually leaves the Naval Academy because of academic failure.

Q. *Do I get to choose any of my courses?*

A. Yes, you will choose your major and the majority of your courses. Most midshipmen get their first choice of a major. Occasionally, however, in order to better meet the future needs of the Navy, midshipmen must accept their second choice.

Q. *How much social life would I have at the Academy?*

A. Social life is *very* limited during the first year. After the initial (plebe) year, a growing range of social activities becomes available. In addition to weekend dances and other extracurricular activities at the Academy, there are opportunities for afternoon liberties in town and for a number of weekends away from the Academy.

Q. *I am a high school freshman. When should I start preparing myself for the Academy?*

A. Now! Your entire four-year high school record in academics and your record in athletics and other extracurricular activities for your final three years will be evaluated by the Naval Academy.

Q. *I am in college. Is it too late to enter the Academy?*

A. No, as long as you will not have passed your 22nd birthday on July 1 of the year of admission. Prior college work will permit study of advanced courses at the Academy. Normally, about six to eight percent of the members of an entering class have completed college courses.

Q. *If I am not selected for an appointment for one class, am I eligible to apply for the next?*

A. Yes, as long as you still meet the basic eligibility requirements pertaining to age, citizenship, etc., *and* obtain a new nomination (see Previous Candidates, pg 77). Also, each year, a number of the most promising of our unsuccessful civilian candidates are invited by the Academy to enlist in the Naval Reserve for the express purpose of attending the Naval Academy Prep School. Here, they become eligible to compete for entry into the Academy under a Secretary of the Navy nomination.

Q. *When should I apply for a nomination?*

A. Apply to the representative from your Congressional district and to both your U.S. senators for a nomination,

"After the prestige of being here wore off, I had to ask myself why I was here. But now I look on it as a challenge, and I'm pretty excited about the Academy and the Navy."

"People at the Academy are trying to help you graduate. If you get into any trouble academically, anybody here would be willing to help you out. This is one thing that other colleges don't offer."

in the spring of your *junior* year in high school whenever possible. Although a few apply as late as December of the senior year, this is not advised since most members of Congress will have selected their nominees by this time.

Q. *What is my military obligation on graduation?*

A. Current directives require five years of active duty as a commissioned officer in the Navy or Marine Corps and three years of duty in the inactive reserve.

Q. *Does the Naval Academy have a pre-law major?*

A. While the Academy has no pre-law program, most law schools do not specify a particular undergraduate rogram. Doing well in any major at the Academy is a good preparation for eventual law school admission.

Q. *Can I take pre-medical studies at the Academy and become a doctor?*

A. Yes, up to 15 midshipmen in each graduating class may be selected to enter directly into medical school to prepare for service as a Navy doctor. Prospective selectees will take organic chemistry and biology courses which are included in the chemistry major. There is no guarantee of selection for this very limited program.

Q. *My father was in the armed forces. Will this help me to get a nomination?*

A. Sons and daughters of career members of the regular and reserve forces, active duty or retired (other than those retired under Section 1331 of Title 10, U.S. Code), may be considered for nomination under the Presidential category.

Q. *What if a midshipman is found to be smoking marijuana or to be using other unauthorized drugs?*

A. The Navy is *tough* on drugs. No person, officer or enlisted, is accepted into the Navy whose pattern of drug involvement indicates dependency, or who has a record of drug-trafficking offenses. Induction Day physical examinations at the Naval Academy include urinalysis testing for evidence of marijuana or other unauthorized drug use. This provides an informative data base and enables explicit counseling for those who need it. Illicit drug use while serving in the Navy is not tolerated. Failure to abide by this zero-tolerance drug policy—here or anywhere else—during your four years as a midshipman will result in separation from the Naval Academy. *Following* commissioning as an officer, such an offense could lead to trial by court martial, which can result in a punitive discharge and confinement at hard labor or an adminstrative discharge under other than honorable conditions.

Q. *Where do midshipmen live?*

A. They are housed in one large building, Bancroft Hall, having more than 4.8 miles of corridors and 33 acres of floor space. Each room has its own shower and all rooms have been remodeled in recent years. Fleet Admiral Ernest J. King Hall connects to Bancroft Hall. Here all 4,500 idshipmen are able to sit down and eat at one time. Bancroft Hall contains a store, medical and dental facilities, a snack bar, bowling alleys, and numerous other facilities.

Q. *I have nominations to both the Naval and the Air Force Academies. Must I undergo two medical examinations?*

A. No. A single medical examination conducted at any of the military examining centers designated by the Department of Defense Medical Examination Review Board is acceptable for all service academies.

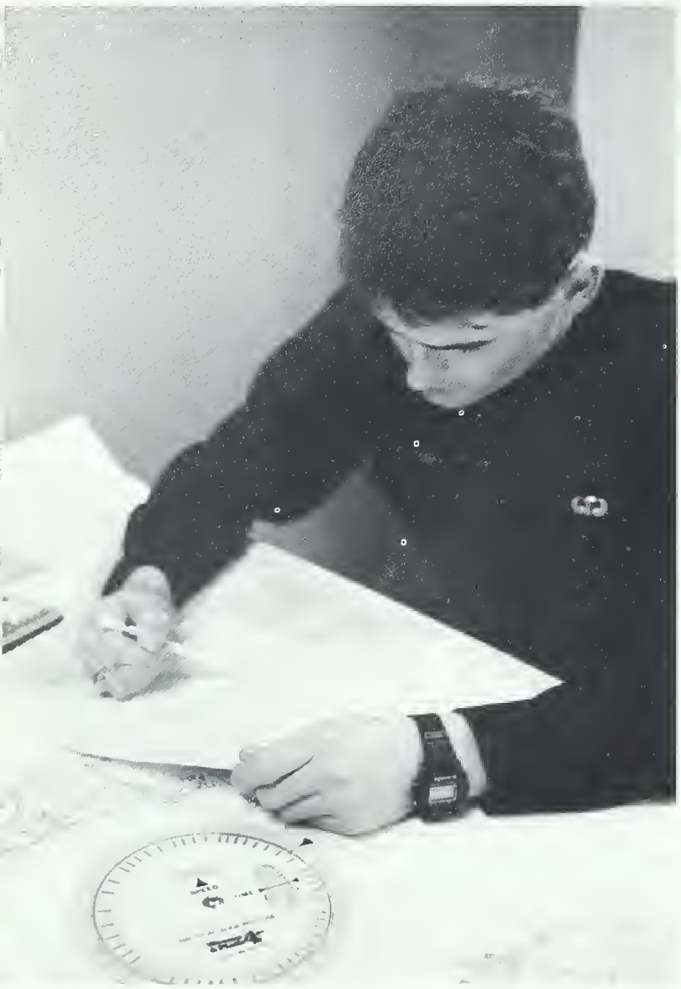
Q. *What reasons are given most frequently by plebes who resign from the Academy?*

A. Resigning plebes most frequently say:

(1) They came to the Academy under parental pressure. After a few weeks as plebes, they feel that they have fulfilled their obligation to their parents and can safely resign.

(2) They were attracted to the Academy by its glamour. They knew that the academic program was demanding, but they failed to realize the extent of the daily demands made on their time by the military and professional aspects of the training at Annapolis. Some, apparently, were expecting more of a relaxed, college-type NROTC program than the regimen of a service academy.

"Whether an upperclassman thinks women should be here or shouldn't is irrelevant. I'm here to become an officer, and I'm going to do my best to prepare myself for that goal."



"I came here because I am serious about the business of learning."

Q. *As a male graduate, what are my career choices on graduation?*

A. During the second semester of the senior year, midshipmen found medically qualified for commissioning as line officers choose from the following service selections on graduation: (1) the surface warfare community, (2) the submarine service, (3) naval aviation, or (4) the U.S. Marine Corps (either ground or pilot/aviation officer training). Additionally, up to five highly qualified graduates may be selected for the Navy Engineering Duty officer specialty. Those not medically qualified for line duties are commissioned in the staff corps or the restricted line.

Q. *How do I apply and what are my chances of getting into the Naval Academy Preparatory School?*

A. Whether you are military or civilian, no application is necessary. All nominees are considered *automatically* for entry into the Prep School by the Naval Academy's Admissions Board (based on their records) in the event they are unsuccessful in being selected for an appointment to the Naval Academy.

Q. *Is there a Naval Academy representative near my home town?*

A. There are more than 1,500 Naval Academy Information Officers available for counseling throughout the country. See appendix E for your nearest State/Area Coodinator.

Q. *Sea duty aboard a Navy ship sounds romantic, challenging, and all that, but how about family life? Family separations?*

A. Tough questions! A lot depends on you and the way your family looks at the Navy and your career.

In spite of the separations due to sea duty, most good marriages prosper in the Navy. Navy families are a close, loyal, and proud group. Many feel their lives are enriched by the travel, friendships, and challenges offered through varied tours of duty in the Navy.

NAVY
NAVY
NAVY

"The opportunities here are unlimited. You can do as much as you want."

CHAPTER 6

The Academic Challenge

The central objective of the Naval Academy since its founding in 1845 has been to develop professional officers. The elements necessary to that professionalism have expanded dramatically. Today, the Academy provides a realistic military experience as backdrop for an intense academic adventure. The curriculum blends professional subjects with physical development and a combination of required and elective courses similar to the programs of other colleges.

With the aid of academic and military advisers, midshipmen design their own blend of the curriculum's three elements:

- Courses providing the professional and leadership skills required in the strenuous and technical modern Navy.
- "Core" requirements in the humanities, engineering, social sciences, and natural sciences which assure that graduates are able to think, solve problems, and express conclusions clearly.
- The completion of a major program in an academic subject freely chosen by midshipmen to develop their interests and talents.

The Naval Academy offers major programs in eighteen subject areas: eight in engineering; six in science and mathematics, including computer science; and four in the humanities and social sciences. In their upper-class years, students with excellent records may be invited to enter rigorous honors programs offered by the Departments of Economics, English, History, and Political Science. Midshipmen successfully completing these programs will be awarded designated degrees "with honors." Seven of the engineering majors are professionally accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology. Midshipmen completing these programs also receive designated degrees such as "Bachelor of Science in Naval Architecture."

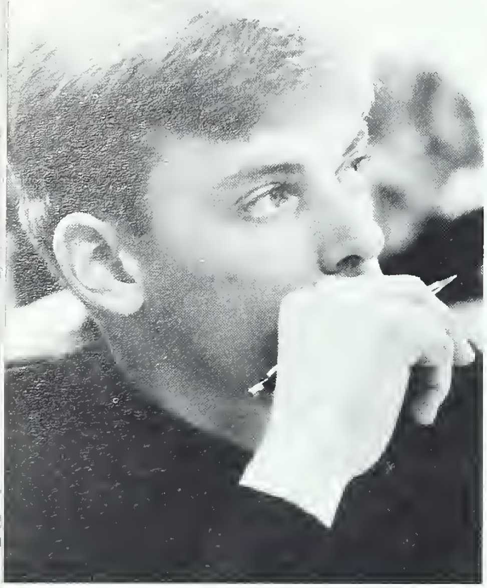
The Classroom Experience

The Naval Academy's philosophy centers on providing small classes of from eight to 26 or 27 students taught by fully qualified faculty. Few classrooms at the Academy were designed to accommodate more than 20. Even large, required courses are divided into these small sections. Midshipmen receive much individual attention from their instructors. In science and engineering classes, the same professor who lectures in the classroom also supervises lab experiments. This is in sharp contrast to most universities, where scholars may lecture in halls holding hundreds, but any real contact with

undergraduates in labs or "discussion sections" is delegated to graduate students.

All midshipmen admitted to the Naval Academy have the ability to accomplish its academic requirements. The instructor's purpose is to assure that midshipmen master course material. If this can't be accomplished during class time, faculty offer extra instruction, commonly called "E.I.", on either a formal or informal basis.

Classrooms and laboratories at the Naval Academy are some of the best-equipped of any undergraduate college or university in the nation. A full range of facilities and services for student and faculty research, computer-aided education, and educational television is available throughout the academic complex.



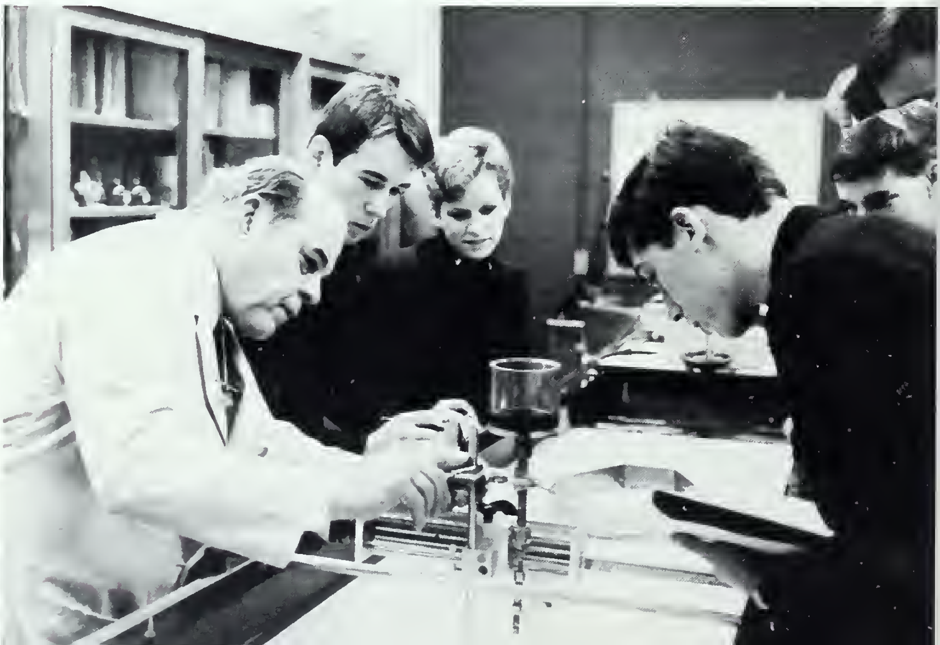
"The Naval Academy has everything, everything every other college has and more."

Choosing a Major

A midshipman's choice of major influences the number of related and supporting courses required in science, engineering, mathematics, or foreign languages. Majors in the scientific-technical fields entail more courses, at higher levels, in mathematics, science, and engineering, for example, than do non-technical majors. The scientific-technical programs require no foreign language. On the other hand, programs in social sciences, international studies, and English do require foreign language study, as well as four semesters of mathematics, one year of chemisty, and a year of physics.

Some plebes are sure of their study preferences and their academic aptitudes when they enter the Academy. However, midshipmen are not normally ready to make a firm selection of their major at the beginning of plebe year. They may have a general idea of the area of interest, without being sure of which major they should take. They may not yet know whether their talents lie in a technical or nontechnical field. And, during plebe year, they may very well discover that their real interests and abilities do not fit the requirements of the major fields they first considered.

For these reasons, selection of a major is delayed until near the end of the common Plebe Year, when the midshipman has completed nearly two semesters of fundamental courses. Approval by the Academic Dean of each midshipman's choice of major is limited only by the availability of institutional resources.



The Common Plebe Year

During the first year at the Naval Academy, midshipmen are placed in a program of study at a level suited to ability and academic background. Plebe-year courses are broad enough in scope to provide a sound basis for the selection of a major during the latter part of the year. At the same time they contain an element of commonality which enables midshipmen to progress into any of the majors offered. They include the naval science courses which start professional development. The normal academic load for a plebe consists of six courses each semester as follows:

> *"When I first got here, I thought it was going to be hard as hell. I was right, but now that I've been here awhile, it's worth it."*

First Semester			Second Semester		
NL102	Leadership I	2–0–2	NS101	Fundamentals of Naval Science	2–2–3
HH105	Western Cultural Heritage to 1815	3–0–3	HH106	Civilization & the Atlantic Community Since 1776	3–0–3
HE111*	Rhetoric and Introduction to Literature I	3–0–3	HE112*	Rhetoric and Introduction to Literature II	3–0–3
**	Calculus I	4–0–4	**	Calculus II	4–0–4
**	Chemistry	3–2–4	**	Chemistry	3–2–4
SI180	Fundamentals of Computing	3–0–3	EN100	Introduction to Naval Engineering	2–0–2
		18–2–19†			17–4–19

*Students selected by the English Department take HE101 Practical Writing the first semester, HE111 the second semester, and HE112 during their third class (second) year.

**Offered at several levels, depending on the background and academic ability of the midshipman. In the case of Calculus I, the lowest level is a pre-calculus course, SM005, for midshipmen whose academic background has not adequately prepared them for calculus. It does not count as part of the minimum mathematics requirement.

†18 hours of classroom recitations per week; 2 hours of laboratory work per week; 19 total semester hours credit.

Fundamentals of Naval Science and Introduction to Naval Engineering. These courses provide first-year midshipmen with knowledge and skills for practical shipboard use during youngster cruise, the most important event of third-class summer. They also serve as preparation for the professional courses and training which come during the next three years.

History. The plebe history program is a two-semester sequence, which analyzes the Western cultural heritage. In the first semester, students examine the development of the Western value system from the ancient world through the French Revolution. The second semester's study begins with the American Revolution and concludes with the present day. A fuller understanding of the progress of Western culture is made possible by incorporating literature, art, architecture, music, and other cultural expressions into this course of study.

Mathematics. A full year of calculus provides the requisite mathematical foundation for further study in the various majors. Midshipmen are placed in a sequence appropriate to their background and ability.

Writing, Rhetoric, and Literature. These courses are designed to develop primary tools for further education and professional development. Includes intensive practice in a variety of writing techniques, critical thinking, and reading.

Chemistry. A full year of study is required in this basic discipline. Midshipmen are placed in course sequences of varying difficulty depending upon their ability and background.

"Most of them (the profs) will tell you, 'Anything until 11 o'clock (at night); if it's important call me.' You know you'll get help if you are really hurting. They'll help you out."

Computer Science. Midshipmen receive a one-semester introduction to the use of the computer during plebe year. Computers are increasingly important in the modern navy, and midshipmen are expected to use them as tools in many of their Naval Academy courses.

Leadership. This introductory course is designed to instill in midshipmen a professional sense of purpose and personal honor, those military leadership traits and techniques which will insure credibility in communication of their ideas and commands, and an appreciation for individual and organizational factors which influence their performance as leaders.

"It was mentally challenging, but it's good working under pressure. Many people are not aware of their own capabilities."

Advanced Placement

Prior to entering the Naval Academy, many midshipmen take college-level courses. One or more of the following are considered in determining whether to grant credit for this work: Validation examinations given by the appropriate academic departments, transcripts, and results of College Entrance Examination Board of Achievement Tests and Advanced Placement Tests, if available. Validators of any of the plebe courses may be enrolled in more advanced courses during plebe year, if they desire, or they may elect to carry a lighter academic load. All midshipmen, however, must carry at least 15 semester hours. Over half of the members of a plebe class validate one or more courses.

Counseling and Guidance

Midshipmen are responsible not only for choosing their major, but also for selecting specific courses and planning their semester schedules. Thus, they may set, within certain limits, the pace of studies to match their capabilities. Average students, for example, likely will take sequential courses for normal progress in a given major program. If ready for advanced placement in some subjects, or able to handle more than the standard number of courses, midshipmen may complete the requirements more rapidly and gain time for more elective courses. Some midshipmen may even complete second majors.

Although decisions regarding their academic program must be their own, midshipmen have ample opportunities for consultation with faculty members. During the first few weeks at the Naval Academy, they receive about 20 hours of group and individual counseling on all aspects of the curriculum. They also take a number of achievement tests to help determine the levels at which studies should begin.

Temporary academic advisers are assigned to the fourth class midshipmen until a major is chosen, normally in the spring of plebe year. Following selection of a major, a faculty member from the department in which the student has expressed a particular interest will be assigned as permanent faculty adviser to help define study objectives and offer guidance toward a logical selection of courses. In addition, the faculty adviser is concerned with overall academic progress and any academic problems encountered from plebe year through graduation.

"Leadership is the essence of what we're about otherwise we'd send everybody to M.I.T. or Stanford."

Captain
Richard A. Stratton, USN

Professional Course Requirements

A series of professional courses is required for the Bachelor of Science degree. These courses prepare midshipmen for their summer cruises with the Fleet and provide the professional background required of officers during their first few years in the Fleet or the Marine Corps. Because the professional courses required subsequent to plebe year vary slightly, depending on the majors program being followed, these requirements are specified with descriptions of the various majors beginning on page 106.

Distribution Requirements

To assure a broad general education and to provide a sound background for further study in selected majors, midshipmen must satisfy certain distribution requirements in the humanities, social sciences, mathematics, science, and a modern language. These requirements are specified under the requirements for each major (chapter 7).

Academic Organization

The major academic areas under the direction of the Academic Dean are organized into four divisions — the Divisions of Engineering and Weapons, Mathematics and Science, U.S. and International Studies, and English and History — each headed by a Navy captain or Marine colonel. A fifth major academic area, the Division of Professional Development, is under the cognizance of the Commandant of Midshipmen. The divisions are further subdivided into academic departments, 17 in all, which serve as focal points for the administration of the majors program and for the continuing review and development of the curriculum. The departments are chaired by civilian or military members of the faculty.

Nimitz Library

The Nimitz Library, completed in 1973, offers midshipmen and faculty comprehensive library services in support of the curriculum, research, and recreational reading. A representative book collection is maintained in pertinent fields of knowledge, and the library is especially strong in naval science and history. In addition, the excellent resources of the libraries in the Washington and Baltimore areas are available to midshipmen and faculty.

The library contains more than 500,000 volumes and accommodates between 1,400 and 1,500 readers, utilizing a seating combination of study tables, study carrels, and lounge furniture. Included in the building are seminar, faculty and group-study rooms, typing and calculating rooms, audio and video carrels, and a computer terminal room.

The Naval Academy Archives, the Division of U.S. and International Studies, the Educational Resources Center, and the Naval Academy Photographic Laboratory are also located within the library building.

"I don't think I could have gotten a better education anywhere else. Each course is given for a reason. Not only did I take political science and liberal arts courses, I also got my share of math and science."

Academic Computing Facilities

Nationally recognized for its use of computers in education, the Naval Academy has one of the most modern and extensive time-shared multicomputer systems to be found at any college or university in America. The

computer is recognized as an essential educational resource for broad usage by midshipmen. Some six hundred remote computer terminals, some with color graphics capability, are located throughout the Academy in areas convenient to midshipmen and faculty. They are accessible over 20 hours per day, seven days a week.

Computer languages offered include BASIC, PL/I, FORTRAN, PASCAL, COBAL, APL, and many others. An extensive public library of computer programs is available for instant use. Minicomputers and microcomputers are heavily used in many academic disciplines in addition to the time-sharing system. An ambitious expansion of computer facilities is being undertaken to ensure that future Naval Academy graduates will be able to function competently in the emerging electronic information age.

Educational Resources Center

The Educational Resources Center (ERC), located within the Nimitz Library building, provides a broad range of services. Functioning as the Academy's central audiovisual control point, ERC is responsible for procurement, administration, and maintenance of virtually all audiovisual hardware and software. It is reponsible for production and distribution of closed circuit TV programming over the Academy's 12-channel system. There is a lending library of educational video tapes and films, an audiovisual equipment loan pool, and a graphic arts studio. Video cassette programs are available as remedial and tutorial tools.

"I was always fascinated by the Academy, and I made it my number one choice of schools I wanted to go to when I first entered high school."

Voluntary Graduate Education

A limited number of first classmen (seniors) who have received advanced standing credit through the validation process are placed in graduate classes at area universities during their final year. This Voluntary Graduate Education Program (VGEP) allows midshipmen to graduate and be commissioned with their class, complete graduate study in the following six months, and go to their first assignments with master's degrees. There is no increase in their service obligation. See Appendix F for further description of graduate opportunities.

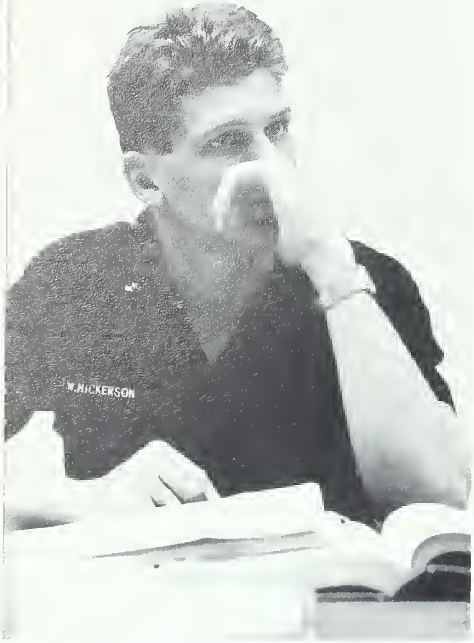
Trident Scholars

Under the Trident Scholar program, initiated in 1963, a small number of exceptionally capable midshipmen are selected to carry out independent research and study during their senior year. Each scholar has a reduced formal course load, since the research and thesis constitute the main part of the academic program for the year. Scholars are assisted in their projects by one or more faculty advisers who are well acquainted with the field of study.

"There are so many things going on that you really have to be sure to set enough time aside to keep your grades up."

Honors Program

Honors programs are offered in History, English, Political Science, and Economics. The honors programs have challenging entrance requirements, and midshipmen enrolled in those programs must demonstrate excellent academic and military performance throughout the course of study. Each discipline requires the completion of a thesis or research project during the year, which is defended orally before a faculty panel. Successful candidates will be awarded a designated degree "with honors."



"There are a lot of smart people here and the course work is tough. At times, I don't really enjoy being the underdog in the classroom."

Grading

The Naval Academy employs the letter grades A, B, C, D, and F (A denoting excellence; F, failing), which are in turn assigned a numerical Quality Point Equivalent (QPE) of 4.0, 3.0, 2.0, 1.0, and 0.0 respectively.

Grades are averaged, using a weighted semester-hour system called Quality Point Rating (QPR). The QPR is computed by multiplying the QPE corresponding to the letter grade received in each course by the semester hours of credit for the course, then dividing the sum of these products by the total number of semester hours represented by all the courses taken. A semester QPR (SQPR) is computed only for courses taken during a given semester; a Cumulative QPR (CQPR) is based upon all academic marks assigned to date.

An academic probation system provides warning for midshipmen who are not making satisfactory progress toward graduation. If a midshipman's cumulative QPR is below 2.0 at the completion of a semester, probation for the following semester is automatically imposed. A midshipman is also placed on probation for the semester following any two consecutive semesters in which the semester QPR is below 2.0, even though the cumulative QPR remains above 2.0.

It should be noted that grades received in military performance, conduct, and physical education, and for certain professional training conducted during the summer, are not included in the computation of QPR. Satisfactory performance *is* required in these areas, however, and these grades are assigned very significant weight in determining class standing.

As required by law, the Academy's Academic Board examines the records of all academically deficient midshipmen for the purpose of deciding which of them should be retained. A midshipman is subject to academic discharge who has failed two or more courses, has a semester QPR below 1.5, has failed to remove academic probation, is two or more courses behind in the matrix of the assigned major, has failed to fulfill a requirement previously assigned by the Academic Board, or has failed to fulfill all graduation requirements at the end of first class year.

On the other end of the grading scale, three honor categories are available to midshipmen. The Superintendent's List honors midshipmen attaining a SQPR of at least 3.4, with no grade below C; with grades of A in military performance and in conduct; and with B or better in physical education. Called "star midshipmen," they proudly wear gold stars on the lapels of their uniforms. The Dean's List honors midshipmen with a minimum SQPR of 3.4 with no failure (F) in any academic course or other area, including professional studies, aptitude, conduct, and physical education. A Commandant's List honors students with a SQPR of at least 2.7, with grades of B in military performance and in conduct and with C or better in physical education.

Graduation Requirements

To qualify for graduation midshipmen must:

(1) Complete the courses specified for the assigned major;

(2) Complete a minimum of 140 credit hours, of which a minimum of 18 credit hours, exclusive of the required English courses, will be in the humanities and social sciences;

(3) Achieve a cumulative quality point rating (CQPR) of at least 2.00; a C average;
(4) Meet required military-professional standards in professional studies and at-sea training;
(5) Meet required standards of military performance, conduct, honor, and physical education;
(6) Accept a commission in the U.S. Navy or U.S. Marine Corps if proffered.

All midshipmen who graduate are awarded the Bachelor of Science degree by the Superintendent, based on the recommendations of the Commandant and the Academic Dean as approved by the Academic Board.

"I'll tell you this: I'm walking out of here with a super education. Free. No one can hold me down now."

Residence

The curriculum at the Naval Academy is of four years' duration, as required by law. This means that students who validate courses or who can carry extra courses have the opportunity to do advanced work, pursue independent study and research, complete the requirements of two majors, or study other subjects for self-improvement or of general interest.

Schedule of Instruction

The calendar year is divided into two semesters and a summer term. The academic year consists of two semesters, each of approximately 16 weeks of instruction and one week of examinations. The academic routine includes five days of classroom, laboratory, and study periods per week. Small classes, averaging 20 midshipmen, provide ample opportunity for active classroom participation by each midshipman and for individual attention.

Academic Emphasis

The emphasis and diversity of the Naval Academy's academic program can best be summarized as follows:

Seven designated Bachelor of Science degrees, requiring 148-150 hours.

Bachelor of Science in Aerospace Engineering
Bachelor of Science in Electrical Engineering
Bachelor of Science in Mechanical Engineering
Bachelor of Science in Marine Engineering
Bachelor of Science in Naval Architecture
Bachelor of Science in Ocean Engineering
Bachelor of Science in Systems Engineering

One undesignated degree, Bachelor of Science, requiring about 144 hours, with majors in:

Chemistry
Mathematics
Computer Science
Oceanography
Physics
Physical Science
General Engineering
*Economics
*English
*History
*Political Science

*There are honors programs in these majors (148–150 hrs) which will lead to designated degrees, "with honors."

CHAPTER 7

Courses of Study

Division of Engineering and Weapons

Department of Aerospace Engineering
Department of Electrical Engineering
Department of Mechanical Engineering
Department of Naval Systems Engineering
Department of Weapons and Systems Engineering

Department of Aerospace Engineering

Aerospace Engineering Major

Aerospace Engineering, a major accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET), focuses on the study of compressible and incompressible fluid flows, conventional and advanced propulsion systems, vehicle performance, stability and control, and modern structural mechanics. It deals primarily with the analysis and design of air cushion vehicles, aircraft, and spacecraft. Basic principles and sound engineering techniques are stressed.

The curriculum provides for various research projects and choice of a wide variety of electives. Throughout the program, extensive use is made of laboratory facilities, which include a propulsion lab; a rotor lab; low-speed, transonic, supersonic, and hypersonic wind tunnels; and a structures lab. Field tests are also conducted using a flight test aircraft, small surface-effects vehicles, and a variable stability flight simulator. Computer techniques are emphasized for data reduction, design, and graphic display.

A solid foundation is laid which permits graduate work in a number of fields. A Bachelor of Science in Aerospace Engineering is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM201 or SM211 or SM251, SM212, SM311;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, FE210 and three electives;
Language: none;
Special: EN201, EM214, EM217, EM231, EM232, EM319, EE331, EE332, ES410;
Major: EA202, EA301, EA302, EA317, EA323, EA331, EA413, EA433, EA440, plus three approved electives.

*Taken during second class summer.

ENGINEERING IN THE N
E OF DISTINCTION

"There was training that taught us to believe that honor comes first, that competence must be made complete by confidence, and that pride is only worth having if you are worthy of it."

Donald W. Douglass
Class of 1913
Founder,
Douglass Aircraft

Aerospace Engineering Courses

EA202 Principles of Flight (2–2–3). Gives a broad overview of aerospace engineering. Topics covered include history of flight, the earth's atmosphere, fluid statics, introductions to fluid dynamics, aerodynamics, and the performance of flight vehicles.

EA301 Aerodynamics (3–0–3). Cover the following topics in theoretical aerodynamcis: potential flow, thin airfoil theory, finite wing theory, and introduction to boundary layer. *Prereq: EA202, Coreq: SM311.*

EA302 Wind Tunnel (1–2–2). A laboratory course in wind tunnel test techniques. *Coreq: EA301.*

EA317 Flight Performance (2–2–3). The basic principles of aerodynamics are extended to include flight vehicle analysis. Modern methods of finite wing analysis are introduced. The time-sharing computer is used to aid in the analysis of typical flight performance prblems and effect on design. *Prereq: EA301.*

EA323 Aerospace Structures I (2–2–3). Applications of statics, dynamics, and solid mechanics to the design of flight vehicle structures. Topics include energy methods, generalized bending, elastic center, shear flow in semimonocoque structures, and indeterminate space trusses. Finite-element solution techniques are introduced. *Prereq: EM217.*

EA331 Gasdynamics I (2–2–3). A comprehensive coverage of the methods of gasdynamics in internal and external flow systems, including thermodynamics of perfect and real gases and fundamental theorems of one-dimensional compressible subsonic and supersonic flows. *Prereq: EA202 or EM324, SM212, and EM319.*

EA411 Orbital Mechanics (3–0–3). A vector mechanical two-body treatment of ballistic missile and spacecraft trajectories. Included topics are: orbit determination, in-plane and out-of-plane orbit changes, position and velocity as a function of time, rendezvous, and vehicle accuracy as a function of launch errors. *Prereq: SM212, EM232.*

EA413 Stability and Control (3–0–3). The aerodynamic and inertial forces and moments acting on the flight vehicle and its component parts are analyzed to determine their effect on static and dynamic stability. *Prereq: EA301 and ES410.*

EA415 Elements of Flight Test Engineering (2–2–3). A flight laboratory course designed to provide practical application of theoretical principles learned in prior courses dealing with flight performance, aerodynamics, and stability and control. Inflight laboratories are conducted in the departmental aircraft. *Prereq: EA317; Coreq: EA413.*

EA421 Aerospace Structures II (3–0–3). Numerical, matrix, and empirical methods of wing and fuselage structural analysis. Use of digital computer for problem solving. Instability analyses of columns, beam-columns, plates and shells including tubing, metal and semi-diagonal tension field beams. *Prereq: EA323.*

EA422 Aeroelasticity (3–0–3). Structural mechanics. Stability criteria. Vibrations. Unsteady two and three dimensional incompressible, subsonic, transonic, sonic, and supersonic aerodynamics. Flutter analysis. Influence coefficient method. *Prereq: EA323, EA301, SM311.*

EA431 Gasdynamics II (3–0–3). Extension of EA331 to include a range of practical and theoretical studies in advanced gasdynamics and high-speed aerodynamics. Linearized potential flow, method of characteristics, design of ducts, compressible viscous flows, and real gas effects. *Prereq: EA331.*

EA433 Flight Propulsion (2–2–3). The principles of fluid dynamics and thermodynamics are specialized to the problem of propulsion of aircraft and space vehicles. *Prereq: EA331, or equivalent.*

EA435 The Aerodynamics of V/STOL Aircraft (3–0–3). An advanced course covering the aerodynamics of vertical and shore take-off and landing aircraft, including fixed-wing and rotary-wing types, with major emphasis on the helicopter. *Prereq: Approval of instructor.*

EA440 Aerospace Vehicle Design (1–4–3). Preliminary design of a flight vehicle. Includes preliminary layout, weight and balance estimates, performance analysis, stability analysis, and structural analysis. Detailed consideration will be given to one aspect of the design. *Prereq: EA323, EA433, EA413, EA317.*

EA450 Computer-Aided Design in Engineering (2–2–3). Introduction to the engineering design process as well as its computer adaptation. Capabilities and utilization of various computer types, such as digital computers, analog computers, and CRT computer graphics are discussed. *Prereq: 2/c or 1/c standing, engineering or science major.*

EX437 Principles of Surface-Effect Vehicles (3–0–3). The governing parameters of air suspension; types and principles of cushioncraft and surface effect vehicles; dynamics of cushion vehicles, plenum chambers, peripheral jets, and wings in ground effect. The external aerodynamics of surface effect vehicles, flight over land and water, drag, and wave interaction. The internal aerodynamics of duct flow, fan design, and valving. Various propulsion schemes and structural designs. An actual two-man hovercraft is used to support the lectures. *Prereq: EM324 or EM319 or EA301 or permission of instructor.*

Department of Electrical Engineering

Electrical Engineering Major

Electrical Engineering, an EAC/ABET-accredited major, combines analysis techniques and experimentation to place primary emphasis on fundamental principles. The resulting basic background, supported by the analytical skills developed, equips graduates for growth and contributions in the expanding and vital fields of electronics, communications, data acquisition, and data processing and display which permeate today's Navy. Outstanding research facilities support the program of study. A Bachelor of Science in Electrical Engineering is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM211, SM212, SM311;
Science: SP221, SP222, SP226, SP431;
Humanities/Social Sciences: HE300*, HH204, and five elective courses;
Language: none required;
Special: EM214, EE221, EE222, EE322, EM318, EM319, EN201, ES410;
Major: EE341, EE342, EE421, EE352, EE423, plus three approved major electives.

*Taken during second class summer

"The more you sweat in peace, the less you bleed in war."

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Electrical Engineering Courses

EE221 Introduction to Electrical Engineering (3–2–4). Terminal characteristics of passive linear and nonlinear devices and energy sources are introduced. Network combinations of these devices are analyzed in the steady state. In addition to mesh and nodal analysis by computer techniques, concepts of equivalence and network theorems are studied in detail. *Prereq: SM112.*

EE222 Circuit Analysis I (3–2–4). This course treats topics in linear and nonlinear network anlysis; time-invariant and time-varying resistance, inductance, and capacitance; impulse response and its convolution; state variables; negative-resistance oscillation and limit cycles; and digital computer methods for solving and checking network equations. *Prereq:* EE221.

EE311 Electrical Fundamentals and Applications I (3–2–4). Provides an understanding of the terminal characteristics of circuit building blocks, including resistors, capacitors, inductors, diodes, and transistors. The basic techniques of circuit analysis using these building blocks to model real devices are presented. Basic principles to logic circuitry are also introduced at this time. *Prereq: SP212.*

EE312 Electrical Fundamentals and Applications II (3–2–4). A continuation of the application of modeling and analysis to practical electronic devices and machines. Covered are basic amplifiers, frequency response characteristics, and signal handling circuitry with emphasis on analog integrated circuits. The course finishes with the principles of operation and analysis techniques applied to transformers and rotating machines. *Prereq: EE311.*

EE313 Logic Design and Microprocessors (3–2–4). Introductory course that progresses from fundamental logic gates through a sequential controller, covering both combinational and sequential circuits. Microcomputer architecture, interfacing and programming. Applications stressed. *Prereq: EE312 or EE332, or permission of instructor.*

EE322 Signals and Systems (3–0–3). The principles of circuit analysis are extended to the transmission of signals through linear systems. The approach is based on determination and interpretation of the natural frequencies, pole zero diagrams, and their relation to the state equations. Transform techniques are applied to the analysis of analog filters. The course closes with an introduction to similar techniques in the discrete sampled time domain and digital filters. *Prereq: EE222.*

EE331 Electrical Engineering I (3–2–4). A study of fundamental DC and AC electrical and electronic circuits. Circuit analysis includes natural and forced response of first and second-order systems; the sinusoidal steady state is investigated in both time and frequency domains. Semiconductor theory is introduced and includes the study of applications of diodes and transistors in the areas of rectification, regulation, waveshaping, and digital logic. *Prereq: SP211, SM211.*

EE332 Electrical Engineering II (3–2–4). Continues student's survey of electrical engineering. Emphasizes the understanding, modelling, and use as signal-handling devices of amplifiers, both discrete and integrated circuit. The course ends with an in-depth look at the characteristics of transformers and rotating machines using previously learned techniques of analysis and modelling. *Prereq: EE331.*

EE341 Electronics I (3–2–4). Each major semiconductor device (p-n junction diode, bipolar and field effect transistors) is introduced by presenting a physical picture of its internal behavior. This approach leads naturally to device characterization in terms of appropriate external variables and allows small-signal and large-signal models to be constructed. Emphasis is on large-signal and digital applications of the devices, especially in integrated circuit form. Applications are emphasized in the weekly laboratory exercises. *Prereq: EE222.*

EE342 Electronics II (3–2–4). Small signal and analog applications in integrated circuit operational amplifier designs. Hybrid parameter and hybrid Pi models are used to predict voltage, current, and power gains; input and output impedances; and frequency response of single-stage and cascaded amplifiers. The feedback concept is discussed in detail, stability is treated quantitatively, and the relationship between "amplifier" and "oscillator" is developed. The course concludes with power circuits and systems. *Prereq: EE341.*

EE352 Communications Electronics (3–0–3). Principles of small-signal and large-signal radio frequency amplifier and oscillator circuits employing discrete circuit elements. Basic principles of amplitude modulation and frequency modulation. Typical circuits for generating AM and FM signals and for demodulating such signals. Radio receivers and alignment techniques. R-F transmission lines and use of the Smith chart for rapid calculations. Directional characteristics of antennas and antenna arrays. Single-sideband transmitters and receivers. Pulse modulation. Principles of FM stereo broadcasting and reception. *Prereq: EE341 or EE332.*

"The opportunities here are unlimited . . . can do as much as you want to."

EE421 Energy Conversion (3–2–4). Characteristics and construction of electromagnetic devices which configure power and control systems, including motors, generators, and transformers. Equivalent circuits are developed and used to predict performance under steady state and dynamic conditions. Laboratory time is spent to determine parameters of equivalent circuits and to compare actual performance with predicted. *Prereq: EE331*

EE423 Electrical Engineering Design (2–2–3). Practice in engineering. Each midshipman chooses a project and writes a report that describes in detail exactly what the student intends to build. Following approval by the instructor, the midshipman builds, trouble-shoots, and packages the proposed circuit. Student devotes remainder of term to gathering performance data and writing a final project report. *Prereq: EE342.*

EE424 Electronic Instruments and Measurements (2–4–4). Fundamentals of electronic measuring instruments with emphasis on digital instruments and on the use of mini/microcomputers in measurements. Not offered every year. *Prereq: EE341.*

EE431 Communications Theory I (3–2–4). An introduction to information theory and fundamental concepts in communication processes. Time and frequency domain characterization of signals and transmission of signals through linear systems are explored. Pulse code modulation, time-division multiplexing, modulation and demodulation techniques, single sideband representation of signals, and matched filter concepts are developed. Statistical techniques are applied to calculate error rates in analog and digital communications systems. *Prereq: SM311.*

EE432 Communications Theory II (3–2–4). Extension of the methods of signals analysis to random processes. Elements of detection theory and decision processes. Emphasis on correlation techniques and digital as well as analog processing. *Prereq: EE431.*

EE451 Electronic Properties of Semiconductors (3–0–3). Develops an understanding of those semiconductor parameters that relate directly to its performance in semiconductor devices. The hole and conduction electron and charge carrier distribution as a function of energy are developed. Charge carrier dynamics leading to drift, diffusion, generation, and recombination are used to investigate transport phenomena. *Prereq: SP222.*

EE452 Semiconductor Electronics (3–2–4). An introduction to the physics and technology of planar silicon devices. The p-n junction is considered in detail and is followed by a treatment of junction transistors and junction field-effect transistors. Also surface effects and surface-controlled devices; theory of semiconductor surfaces, surface effects on p-n junctions, and the MOS field-effect transistor are discussed. The laboratory entails a special report. *Prereq: EE451.*

EE461 Microcomputer-Based Digital Design (3–2–4). A principles-based foundation to the concepts and techniques used in analyzing and designing traditional and microprocessor-based digital systems. The student will acquire a detailed understanding of the system bus; the architecture and interfacing of various processor, memory, and input-output elements; the instruction set; and assembly-language programming. Emphasis is on concepts that will have long-term value. This course is supported by a continually updated laboratory. *Prereq: EE342 or EE332.*

EE462 Microcomputer Interfacing (2–4–4). This course provides a strong foundation in techniques for connecting computers to peripherals and communications devices, and in the methodology for programming the computer to control external devices in real time. Principles that support the technology are stressed to prepare the student fo self-education in the future; this is an absolute necessity in this rapidly changing field. This course is supported by a project-oriented laboratory. *Prereq: EE461.*

EE471 Microwave Systems (3–2–4). Fundamental radar design concepts including application of the radar equipment to CW, FM-CW, MTI, and pulse-doppler radar. Characteristics of microwave components such as power sources, amplifiers, filters, waveguides, and antennas. System performance analysis with emphasis on signal detection and information extraction in an environment corrupted by noise, clutter, and target scintillation. *Prereq: SP431.*

EE478 Naval Sensors (3–0–3). Theoretical principles of passive and active naval sensors operating within the frequency spectrum from audio to visible. Emphasis on conceptual fundamentals which bind together seemingly diverse sensor systems such as: sonar, navigation, radio, television, radar, EMC, ECCM, IFF, laser range finders, infrared imagers, and LLLTV, *Prereq: EE471 or SP436.*

Department of Mechanical Engineering

Mechanical Engineering Major

Mechanical Engineering, an EAC/ABET-accredited major, is the most diverse of the engineering curricula. A sound background in engineering fundamentals, science, and mathematics is provided, and the range of electives offers concentration in several specialized areas of engineering.

In addition to centralized classrooms, shops, analog and digital computing systems, and other interdisciplinary laboratories, the department maintains such diverse facilities as a materials science laboratory complex, dynamics and physical systems laboratory, a solid mechanics laboratory complex, and a thermodynamics and fluid dynamics laboratory. A Bachelor of Science in Mechanical Engineering is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM201 or SM211 or SM251, SM212, SM311;
Science: SP211 and SP212
Humanities/Social Sciences: HE300*, HH204, FE210, and four electives;
Language: none;
Special: EM217, EM231, EM232, EM313, EM319, EM324, EE331, EE332, ES410;
Major: EN201, SM311, EM320, EM371, EM411, EM471, EM472, plus four approved electives.

*Taken during second class summer

"You feel like you've really accomplished something. This is the first time in my life that I've spent a year worthwhile."

General Engineering Major

The General Engineering major gives the student a basic technical education in mathematics, science, engineering fundamentals, and naval professional engineering subjects. It is intended to provide an adequate background for future naval technical training and education. Midshipmen completing the General Engineering major receive a nondesignated Bachelor of Science degree. The major is not accredited by EAC/ABET.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NN303, NN302, ES300, EE311-312, ES400, NL300*, NL400;
Mathematics: SM201 or SM211 or SM251, SM212;
Science: SP211 or SP221, SP212;
Humanities/Social Sciences: HE300*, HH204 and five approved electives;
Language: none;
Special: three approved math, science, or engineering electives;
Major: EN201, EM214, EM217, EM231, EM232, EM327, EM328, EE313, EN405 plus two approved electives.

*Taken during second class summer

Mechanical Engineering Courses

EM214 Elements of Materials Science (2-2-3). An introductory course in the physical, electrical, and mechanical properties of engineering materials including their structures, use in engineering application, environmental effects, and modes of failure. *Prereq: 4/C chemistry; Coreq: Calculus III.*

EM217 Strength of Materials (3-2-4). A first course in mechanics of deformable bodies with emphasis on the engineering approach to the responses of these bodies to various type loadings. Topics include stress-strain relationships, stress-strain analysis, load-deflection, bending, torsion, buckling, temperature effects, and dynamic response. *Prereq: EM231; Coreq: SM212.*

EM231 Statics (2-0-2). An initial course in applied vector mechanics with emphasis on static equilibrium. Topics include forces, moments, couples, equivalent force-couple systems, centroids, distributed forces, and Coulomb friction. The application of the free body diagram in the analysis of static equilibrium of frames, machines, and trusses is stressed. *Prereq: 4/C mathematics; Coreq: Calculus III and General Physics I.*

EM232 Dynamics (3-0-3). A course in classical vector dynamics. Topics include vector algebra and calculus, kinematics, and kinetics of particles and rigid bodies, as well as energy and momentum methods. Extensive problem solving involving particle and rigid body motion is required. *Prereq: EM231; Coreq: SM212.*

EM313 Materials Science (3-2-4). An introductory course in the physical and mechanical properties of engineering materials including, metals, ceramics, and plastics), their structures, use in engineering applications, and failure phenomena. All laboratory projects are structured to provide strong physical illustrations for the topics covered in lectures. *Prereq: EM217.*

"How was I supposed to know that I'd ever wind up this way?"

EM318 Applied Fluid Mechanics (3–0–3). A first course in incompressible fluid mechanics. Topics include properties of fluids, fluid statics, integral conservation equations, differential field analysis, dimensional analysis and similitude, incompressible boundary layers, viscous flow in conduits, and flow about immersed bodies. *Prereq: EM319 or equivalent.*

EM319 Engineering Thermodynamics (3–0–3). A basic thermodynamics course in which the first and second laws of thermodynamics are studied primarily from the classical macroscopic viewpoint and applied to both closed and open systems. Working substances include perfect gases, real gases, and vapors in addition to solids and liquids. Naval applications are emphasized. *Coreq: SM212.*

EM320 Applied Thermodynamics (2–2–3). Laboratory equipment which operates on principles of thermodynamics and fluid mechanics is used to reinforce a study of gas and vapor power cycles, refrigeration and air conditioning, ship and aircraft propulsion systems, combustion, energy conversion, and compressible flow. *Prereq: EM319 or equivalent.*

EM324 Fluid Dynamics (3–2–4). An introductory course in fluid dynamics stressing both the integral and differential forms of the conservation laws of fluid flow. Engineering applications are made to hydrostatics and to ideal and real fluid flows. Laboratory experiments and problems sessions complement the lectures. *Prereq: EM319 or equivalent.*

EM327 Essentials of Fluid Dynamics (3–0–3). An introductory study of the behavior of fluids at rest and in motion. Effects of various fluid properties and forces on flow patterns, and force interaction between fluid and its boundaries are presented. *Prereq: SM212 or SM202.*

EM328 Thermodynamics (3–0–3). An introductory course in classical thermodynamics stressing the understanding and application of the basic laws of thermodynamics. A logical development of the relationships among physical properties of interest in the thermal sciences is also presented. *Prereq: SM212.*

EM371 Introduction to Design (2–2–3). Fundamentals of mechanical design, with emphasis on the design of pertinent machine elements. Topics such as fasteners, springs, anti-friction bearings, lubrication and journal bearings, gearing, and shafts are covered. *Prereq: EM217, EM232.*

EM411 Heat Transfer (3–0–3). Study of thermal radiation, steady and transient conduction, laminar and turbulent convection, internal and external flow, boundary layers, and empirical correlations. Applications address fins, nuclear reactor cooling, heat exchangers, and interactive computing. *Prereq: EM319 and EM324.*

EM417 Intermediate Mechanics of Materials (3–0–3). A continuation of EM217: elastic/plastic stress/strain, torsion, bending, transverse loading of unsymmetrical beams. Deflection, energy methods, plate and shell theory. *Prereq: EM217.*

EM423 Mechanical Vibrations (3–0–3). The treatment of vibration fundamentals, including free, damped, and forced harmonic vibrations of linear single and multi-degree of freedom systems, transient and nonperiodic vibrations, continuous systems, and random vibration analysis. *Prereq: EM217, EM232, SM311.*

EM425 Process Dynamics (2–2–3). Ship propulsion system elements such as pressure vessels and heat exchangers are described by mathematical models. Theoretical responses are compared with pilot plant outputs. Predictive power of the mathematical models is improved by parameter adjustment. *Prereq: SM212.*

EM426 Process Control (2–2–3). Mathematical models are developed for typical shipboard systems where thermodynamic variables such as temperature and pressure are controlled automatically. Theoretical responses are compared to outputs of pilot plant models of these same systems. *Prereq: SM212.*

EM431 Experimental Stress Analysis (2–2–3). Theoretical considerations of combined stresses are compared with experimental methods. Electrical resistance strain gage, photoelasticity, moiré, and brittle-coating techniques are studies in detail and extensively used in the laboratory. *Prereq: EM217.*

EM432 Computer Methods in Structural Mechanics (3–0–3). Structural design and analysis; matrix formulation employing flexibility and stiffness methods of analysis, computer languages, and techniques in structural design. Topics include temperature effects, effects of settlement of supports, and misfit of structural parts. *Prereq: EM217.*

EM434 Advanced Mechanics of Materials (3–0–3). Topics include theories of elasticity and plasticity, stress and strain as tensors, compatibility and constitutive relationships, energy methods, stability, yield functions, behavior of time dependent materials, plasticity limit theorems, plastic design. *Prereq: EM217, SM311.*

EM442 Computer Graphics and Engineering Mechanisms (3–0–3). Mathematical theory of computer

graphics; including curves, surfaces, transformations, and projections. Use of computer graphics to analyze the behavior and calculate the properties of mechanisms such as cams, gears, and 4-bar linkages. *Prereq: 1/C or 2/C standing.*

EM443 Energy Conversion (3–0–3). Introduction to energy conversion and utilization. Terrestrial and thermodynamic limitations, direct energy conversion devices, alternative energy sources, present and future energy research and development, and energy usage and economy are presented. *Prereq: EM319 or equivalent.*

EM446 Environmental Systems Engineering (3–0–3). Principles of thermodynamics, heat transfer, and fluid mechanics as applied to the creation and control of thermal environments. Cycles and equipment for heating, cooling, and humidity control. Air transmission, distribution, and cleaning are also considered. *Prereq: EM319 or equivalent.*

EM450 Compressible Flow and Turbomachinery (3–0–3). Fundamental principles of fluid dynamics and thermodynamics are applied to one-dimensional compressible flows. Topics include varying-area isentropic flow, flow with friction, flow with heat transfer, and normal and oblique shock waves. Introductory concepts in the design and analysis of turbomachinery are covered. *Prereq: EM320, EM324.*

EM453 Physical Metallury (3–0–3). Study of the principles of physical metallurgy including imperfections in crystal structures, liquid and solid phases of metals, phase transformations, and solid-state reactions with applications to metallurgical processes such as casting and welding. *Prereq: EM313 or EM214.*

EM454 Mechanical Behavior of Materials (3–0–3). Treatment of mechanical behavior from a materials viewpoint. Elastic, elastic-plastic, and viscoelastic behavior are treated, as well as modes of fracture, including brittle and ductile. Scanning electron microscopy is performed for fractography. Ductile-to-brittle transition, elastic and elastic-plastic fracture mechanics, fatigue, and creep are considered. *Prereq: EM214 or EM313 and EM217.*

EM461 Combustion: Principles and Applications (2–2–3). An introductory course in combustion science covering basic principles and applications. Fuel science topics such as solid, liquid, and gaseous fuel sources; heating values of fuels; combustion products; and environmental impacts are covered. The principles of combustion are then applied to a variety of internal and external combustion systems both analytically and experimentally. *Prereq: EM324 or equivalent.*

EM471 Mechanical Engineering Experimentation (2–2–3). Planning experiments and making measurements. Statistical inference plan; data analysis; detailed work on thermocouples and strain gages; pressure, flow, vibration, and other measurements; and testing for signal validity. *Prereq: 1/C standing in mechanical engineering major or approval of department chairman.*

EM472 Mechanical Design (2–2–3). A detailed study of the engineering design process through lectures and case studies emphasizing design phases, engineering economics, and program management. Practical experience is gained by participation in team projects. *Prereq: EM371, or approval of department chairman.*

"If I had to do it all over again, I would."

> *"Ours is a maritime nation, requiring the most powerful navies to protect our free rights to the farthest reaches of the seas."*
>
> PRESIDENT
> LYNDON B. JOHNSON

Department of Naval Systems Engineering

Marine Engineering Major

Marine Engineering, an EAC/ABET-accredited major, is concerned with the analysis and design of energy systems. This major provides an excellent background for the Navy's Nuclear Power Program.

A broad background in engineering fundamentals is learned by students, who then apply these principles in their studies of energy systems. These include conventional steam and nuclear power plants, gas turbines, and such advanced power systems as fuel cells and thermoelectric units.

A course covering the principles of naval engineering systems develops an understanding of the principles of ship design and construction. The course also introduces students to the problems of analyzing and designing systems for use in the ocean environment. Physics prepares the student for the reactor physics and reactor engineering courses. Studies in heat transfer—so essential in the study of modern energy systems—follow.

Knowledge gained from these studies then is used in the analysis of marine propulsion plants and in group designs of future propulsion systems. Past designs by students have included the concept design of a propulsion plant for a low-water-plane catamaran, preliminary design of a submarine waste disposal system, and the concept design of an offshore nuclear power plant. A Bachelor of Science in Marine Engineering is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM211, SM212, SM311;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, and four electives;
Language: none
Special: EM217, EM231, EM232, EM313, EM319, EM324, EE331, EE332, ES410;
Major: EN201, EN241, EN361, EN362, EN460, EN463, EN465, EM411, plus three approved electives.

*Taken during second class summer

Naval Architecture Major

Naval Architecture, an EAC/ABET-accredited major, is unlike most engineering disciplines which are unified by the nature of the phenomena involved. This major originally came into being as a discipline because of a single end-product, the ship. A special combination of knowledge and experience is needed to develop, design, and build this single product. Variety exists not only in the kinds of work (design, research, cost estimation, management, etc.), but also in the types of craft involved—from sailboats to aircraft carriers, hydrofoil boats to catamarans, and submarines to surface-effect vehicles.

Naval architects use both art and engineering in designing ships. Armed with imagination and experience, they convert functional requirements into a suitable, cost-effective design. They analyze and select the best dimensions and hull form, calculate the power requirements, and estimate the weights of the principal components. They design and analyze the hull structure and decide on the location of military subsystems, machinery spaces, accommodations, and stores. Additionally, the ship must be divided into watertight compartments so that, if damaged, the chances of survival are maximized. Weighing and compromising all such conflicting needs in the design of the ship are the creative and challenging responsibilities of the naval architect.

Naval architecture at the Naval Academy approaches these topics in a fully integrated program of classroom sessions, hands-on laboratory work, field trips, and the latest in computer-aided design and analysis techniques. A Bachelor of Science in Naval Architecture is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM211, SM212, SM311
Science: SP211, SP212
Humanities/Social Sciences: HE300*, HH204, and four electives;
Language: none;
Special: EM217, EM231, EM232, EM318, EM319, EE331, EE332, ES410;
Major: EN201, EN242, EN351, EN352, EN358, EN361, EN382, EN453, EN467, EN476, plus two approved electives.

*Taken during second class summer

"Being at the Academy is the best thing that ever happened to me. I'm really amazed at how far I've come and how much I've accomplished."

Ocean Engineering Major

Ocean Engineering, an EAC/ABET-accredited major, is the key to the last frontier on earth—the ocean depths. This is an interdisciplinary field involving the application of engineering principles to hardware systems in the ocean environment. The curriculum stresses fundamentals of mathematics, physics, mechanical engineering, electrical engineering, and oceanography. Then these fundamentals are applied in ocean engineering courses which include analysis of ocean materials, power systems, wave mechanics, life-support systems, ocean energy, and a wide variety of ocean vehicles and offshore and coastal structures.

Laboratory experiments are conducted in the 120-foot towing tank and coastal engineering basin. Both are equipped with pneumatic wave-makers and instrumented with sophisticated sensors and on-line data acquisition and analysis equipment. The Naval Academy's computer systems are used in solving design problems. Sediment laboratory and environmental chamber facilities are also available. A Bachelor of Science in Ocean Engineering is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM211, SM212, SM311;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, and four electives;
Language: none;
Special: EM217, EM231, EM232, EM319, EM324, EE331, EE332, ES410;
Major: SO221, EN241, EN361, EN382, EN441, EN461, EN462, EN475, plus three approved electives.

*Taken during second class summer

"It cannot be too often repeated that in modern war, and especially in modern naval war, the chief factor in achieving triumph is what has been done in the way of thorough preparation and training before the beginning of war."

PRESIDENT THEODORE ROOSEVELT

Naval Systems Engineering Courses

EN100 Introduction to Naval Engineering (2–0–2). An introduction to the components, function, and basic operation of the various common propulsion systems and auxiliary engineering equipment used by the naval service including safety considerations involved with shipboard equipment. Also ship's stability, damage control, electrical distribution, hull construction, and hydraulics.

EN200 Naval Engineering I (3–2–4). An introduction to ship systems, including basic methods of ship procurement, construction, and powerplant selection. Principles of ship stability and operability as related to preventive and corrective damage control. *Prereq: EN100, Physics I, 3/C cruise.*

EN201 Engineering Design Graphics (0–2–1). An introduction to engineering graphical methods and disciplines with emphasis on spatial visualization and design. Topics include orthographic projection, axonometric drawing, and descriptive geometry.

EN241 Introduction to Naval Systems Engineering (3–0–3). This course provides an application of basic mathematics, physics, and mechanics to marine vehicles and static marine systems. It provides a background in naval architecture and ocean engineering to prepare a midshipman for future major electives offered by the department. Specific topics include ship stability, resistance and powering, maneuvering principles, materials in the ocean, and marine structural principles. *Prereq: EM231 or permission.*

EN242 Introduction to Naval Architecture (1–2–2). Provides a technical overview of engineering areas of the naval architecture curriculum. A ship's line drawing is created in the laboratory. Introduces the specialized nomenclature and engineering tools of the naval architect. *Prereq: EN201, EM231.*

EN300 Naval Engineering II (3–2–4). A study of naval engineering systems, including the principles of energy conversion and the basic operation of steam, gas turbine, and internal combustion engine powerplants. *Prereq: EN100, Physics I, 3/C cruise.*

EN351 Ship Hydrostatics (3–2–4). Transverse and longitudinal stability of both surface ships and submersibles are studied. Flooding and stability of ships in the damaged condition are covered. Digital computers are used to solve hydrostatic problems. *Prereq; EM231.*

EN352 Resistance and Propulsion (3–0–3) Topics: dimensional analysis, similitude, wave and viscous resistance of ships, ship-model testing techniques, full-scale performance prediction, momentum theory of propulsive devices, and propeller vibrations and design. *Prereq: EN351, EM318 or EM324.*

EN358 Ship Structures (3–2–4). A course in structural theory and practice. Topics include longitudinal and transverse strength of the hull girder, bending moments in a seaway, plate theory, development of the ship's structural design, submarine pressure hull design, and shipbuilding materials. *Prereq. EM217, EN351.*

EN361 Marine Power Systems (2–2–3). This is a case study course in which the students use theoretical thermodynamics and fluid mechanics in order to analyze a typical ship's power plant. Steam and gas turbine plants are covered. Energy from conventional means is studied and energy from nuclear sources is discussed. In the laboratory students receive a hands-on relationship with steam and gas turbine plants and work out the performance characteristics of the various components. *Prereq: EM319; Coreq. EM318 or EM324.*

EN362 Reactor Physics I (3–0–3). An introductory course in nuclear reactors covering fission, neutron diffusion, material and geometric buckling, and the critical equation. Bare and reflected homogeneous reactors are studied. *Prereq: SM212 or equivalent.*

EN382 Ocean Materials Science and Engineering (3–2–4). Deals with the optimal use of materials in ocean systems with emphasis on corrosion prevention. Laboratory projects include heat treatment, mechanical testing of metals, and corrosion and fouling studies. *Prereq: EM217.*

EN405 Naval Applications of Thermodynamics (2–2–3). Provides practical applications for the thermodynamics principles previously acquired, concentrating on marine propulsion systems and their components. Covers the interrelationships between components of a given propulsion plant and the application of basic thermodynamics, fluids, and heat transfer theory to these systems. *Prereq: EM319 or EM328, general engineering major.*

EN410 Seafloor Mechanics (2–2–3). A study of the basic principles of soil mechanics as applied to marine sediments. Topics include shear strength, consolidation, slope stability. *Prereq. EN241 or permission.*

EN420 Coastal Engineering (2–2–3). A study of littoral drift and wave action on coastal structures. Topics include littoral drift past a river estuary, breakwaters, jetties, groins, and harbor design. *Prereq. EM217, EM324, or equivalent.*

EN441 Ocean Engineering Structures (3–0–3). Structural design considerations for fixed ocean structures, mooring systems, and undersea vehicles are analyzed. Design techniques including matrix methods and finite element analysis are introduced. Boundary conditions, wave effects, foundations, loading, and materials considerations are studied. *Prereq. EM217.*

EN450 Engineering Economic Analysis (3–0–3). Basic methods and reasons for conducting an engineering economic study are presented. Economic criteria are developed. Procedures for making a selection from amongst a set of technically feasible alternatives are studied. Assumptions and implications associated with these decision-making procedures are discussed. *Prereq: FE210, 1/C standing.*

EN451 Decision Analysis (3–0–3). The design process and analytical tools required for effective decisions in the design of marine systems are studied. Methods for the analysis and transformation of available data are developed and evaluated. Once procedures for establishing the technical feasibility of a design have been addressed, emphasis shifts to the proper resolution of decisions dominated by economic considerations. *Prereq: 1/C standing as naval architecture major or permission.*

EN453 Seakeeping and Maneuvering (3–0–3). Topics: ship steering, maneuvering, motion, and seakeeping. The basic equations of motion for a maneuvering ship and for ship motions in a seaway are developed, and various methods of solution are discussed. *Prereq. EN352; Coreq: EN467.*

EN454 Ship Vibrations (3–0–3). A ship is a complex elastic structure in which vibration may be caused by periodic forces generated by waves, propellers, or machinery. The basic concepts of vibration, as well as hull, propeller, and machinery-induced vibrations, are considered. *Prereq. EM232.*

EN456 Computer Applications in Naval Architecture (3–0–3). An introduction to computer-aided ship design is presented. Topics include numerical procedures applied to form, stability, resistance, propulsion, motion, maneuvering, and strength. *Prereq. EN352 or permission.*

EN457 Hydrofoil and Propeller Theory (3–0–3). The analysis and design of hydrofoils and marine propellers are presented. Lifting line and lifting surface theories are applied to naval devices. Design and towing tank work supplements recitations. Not offered every year. *Prereq: EN352 or permission.*

EN458 Advanced Marine Vehicles (2–2–3). Modern watercraft discussed: planing boats, hydrofoil craft, ground-effect machines, and combatant and research submersibles. Analysis and design features are investigated experimentally in the towing tank when appropriate. *Prereq: EN453.*

EN460 Marine Engineering Design (2–2–3). Conceptual design of a marine system is accomplished by midshipmen teams. The realistic project format followed involves proposal writing, project manager designation, progress reports, and preparation and design review by experts. *Prereq: 1/C standing as an engineering major.*

EN461 Ocean Engineering Design I (2–2–3). A detailed study of the engineering design process is undertaken including requirements definition, design synthesis, alternative evaluation, criteria optimization and project presentation. Practical experience is gained through design of basic structural elements for fixed ocean facilities. *Prereq: 1/C standing in ocean engineering major or approval of department chairman.*

EN462 Ocean Systems Engineering Design II (1–4–3). Conceptual design of an ocean engineering system is accomplished by midshipmen teams. The realistic project format followed involves proposal writing, project manager designation, progress reports, and design review by experts. *Prereq: EN461.*

EN463 Reactor Physics II (2–2–3). The topics covered include neutron generation times, reactor period, delayed neutrons, negative temperature coefficient, xenon poisoning, control rod theory, shielding, and finally, a reactor kinetics case problem. *Prereq: EN362*

EN465 Advanced Marine Power Systems (3–0–3). A preliminary design of naval powerplants. Through use of a case problem, the student learns to synthesize a large number of machinery elements into a functioning system to give the desired performance. *Prereq. EN361.*

EN466 Computer Methods in Nuclear Engineering (3–0–3). Transient reactor problems are studied using computer numerical methods. Topics include the dynamic analysis of a reactor power primary and secondary loop systems. Matrix, finite difference, and Hansen's methods are used. *Prereq: EN463 or permission*

EN467 Experimental Naval Architecture (1–4–3). This course covers the experimental aspects of marine vehicle resistance, propulsion, and seakeeping. Vehicle hydrodynamics as well as experimental methods, data acquisition systems, and technical report preparation are studied and used. *Prereq. EN352; Coreq: EN453.*

EN468 Nuclear Energy Conversion (3–0–3). Principles of the conversion of nuclear energy into useful power are covered. Various types of nuclear power plants, their design, cycles, load following characteristics, etc., are studied. Direct nuclear energy conversion systems are also studied. *Prereq: EN362.*

EN470 Life Support Systems (3–0–3). The physiological and psychological aspects of "man in the sea" are presented with the related engineering requirements. Topics include hyperbaric physiology, saturation diving, life support equipment, deep dive systems, diving operations and hazards. *Prereq: 1/C engineering major or permission.*

EN474 Ocean Energy Conversion (3–0–3). Covers five ocean energy sources: ocean thermal gradients, wind waves, tides, ocean currents, and salinity gradients. Each source is discussed in terms of the nature of the resource, the conversion technology, and the environmental consequences of the energy conversion. The potential of each source is compared to those energy sources being presently exploited. *Prereq: EM318 or EM324.*

EN475 Ocean Engineering Mechanics (3–2–4). Effects of gravity waves on surfaced and submerged floating bodies and on moored and fixed bodies. Measurement techniques discussed include measurements of wave height, wave-induced forces, and motions in waves. *Prereq: EM318 or EM324, EN241 or permission.*

EN476 Ship Design (1–4–3). This course represents the culmination of an undergraduate naval architecture program in which the student applies technical skills to the design of a ship. *Prereq: EN467.*

EN477 Undersea Power Systems (3–0–3). The principles of design of undersea power systems are presented. Topics include batteries, fuel cells, chemical-dynamic systems, radioisotopes and nuclear reactor systems, and cable systems. *Prereq: EE332, EM318 or EM324, EN241 or permission.*

"I was always interested in the Navy and read any book I could get my hands on that had anything to do with it."

"Women at the Naval Academy do well in terms of education and are doing something they find interesting and exciting. But the word is out that they pay an extra price . However the women who enter figure it is going to be worth it."

Department of Weapons and Systems Engineering

Systems Engineering Major

Systems Engineering is an EAC/ABET-accredited interdisciplinary major encompassing such diverse fields as electronics, fluids, linear physical systems, automatic control systems, digital computer technology, and system simulation using analog, digital, and hybrid computing systems. An overall understanding of the analysis and design of complete engineering systems, including the various interfaces present, is the primary goal. A Bachelor of Science in Systems Engineering is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NS252, ES300, NN302, NL303, NS300*, NL300*, NL400;
Mathematics: SM211, SM212, SM239, SM312;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, FE210, and four electives;
Language: none;
Special: EM231, EM232, EM318, EM319, EE331, EE332;
Major: ES201, ES303, ES305, ES306, ES309, ES402, ES416, plus five approved electives.

*Taken during second class summer

Systems Engineering Courses

ES201 Introduction to Systems Engineering (2–2–3). Introduction to the modeling and control of electrical, mechanical, and hydraulic systems. A survey of the simulation and control laboratory courses available in Systems Engineering. *Prereq: SI100; Coreq: SM212.*

ES300 Naval Weapons Systems (3–0–3). An introduction to the theory of weapons systems through a study of the fundamental principles of sensor, tracking, computational, and weapons delivery subsystems. *Prereq. NS101, SM102, SP212, SC104.*

ES303 Analog/Digital Computer Methods (2–2–3). Principles of analog and digital computer simulation of linear and nonlinear multivariable systems are applied to the study of the behavior of realistic engineering control systems. *Prereq: ES201; Coreq: ES305.*

ES305 Linear Control Systems I (3–0–3). A study of the dynamic behavior of physical systems through classical transform and modern state variable techniques. *Prereq: ES201; Coreq: ES303.*

ES306 Applied Control Systems and Instrumentation (2–2–3). Determination of mathematical model parameters of physical systems by statistical analysis of laboratory data. Comparison of predicted and actual system response. Introduction to hybrid computation. *Prereq: ES303, ES305; Coreq: ES309.*

ES309 Linear Control Systems II (3–0–3). Analysis and design of linear automatic control systems. *Prereq: ES303, ES305; Coreq: ES306.*

ES400 Weapons Systems Engineering (4–0–4). A study of the engineering principles governing the functioning of the various components (in detection, control, delivery, and destruction) of naval weapons systems. *Prereq: ES300, 1/C at-sea training, EN300, EE312.*

ES402 Systems Engineering Design (2–4–4). Introduction to the macro-techniques of engineering design including performance, reliability, management control, redundancy, man-machine systems, and testing techniques. Design, construction, test, and evaluation of an approved project is accomplished in the lab. *Prereq: ES306, ES309.*

ES406 Analog Information Systems (3–0–3). Study of analog information flow and signal-to-noise and signal-to-jamming ratios in communication systems. *Prereq: ES306, ES309, ES412.*

ES407 Hybrid Computer Computation (1–4–3). Introduction to hybrid computation, hardware and software consideration of hybrid interface, digital filter and controller simulations, and solution of boundary value and optimization problems using hybrid techniques. *Prereq: ES306 or consent of instructor.*

ES408 Digital Technology (2–2–3). An introduction to logical organization and internal functioning of digital devices applying sequential machine theory, machine language, Boolean algebra and switching circuits. *Prereq:SI100.*

ES409 Modern Control Systems (3–0–3). Analysis and design of control systems using modern control theory. *Prereq: ES306, ES309.*

ES410 Control Systems and Their Application to Weapons (3–2–4). Linear control systems for engineering majors, using analytical, graphical, and computer techniques. *Prereq: 1/C standing in an engineering major or approval of department chairman.*

ES412 Digital Information Systems (2–2–3). Analysis of digital information and its transfer through communications systems. *Prereq: 1/C standing in an engineering major or approval of department chairman.*

ES414 Sampled Data and Digital Control Systems (2–2–3). Analysis, design, and simulation of digital filters and continuous systems under digital control using z-transforms and modern control techniques. *Prereq: ES306, ES309.*

ES415 Nonlinear Control Systems (2–2–3). Analysis and design of control systems having nonlinear components. *Prereq: ES306, ES309.*

ES416 Advanced Control Systems (3–0–3). A study of advanced topics of automatic control systems including compensation, modern control theory, and nonlinear analysis, and selected topics in research techniques. *Prereq: ES305, ES309.*

ES442 Microcomputers in Control Applications (2–2–3). An introduction to the role of the microcomputer as a component in control systems, applying assembly language programming techniques and a variety of interface hardware. *Prereq: ES408.*

"For they had learned that true safety was to be found in long previous training, and not in eloquent exhortations uttered when they were going into action."

THUCYDIDES

M.W. JONES

Division of Mathematics and Science

Department of Computer Science
Department of Mathematics
Department of Chemistry
Department of Oceanography
Department of Physics

Department of Computer Science

Computer Science Major

The Computer Science major gives students a background in the major facets of computer science with an orientation toward the naval applications of computers. Students elect to pursue studies in one of three sequences: scientific computing, software design, or hardware principles. An undesignated Bachelor of Science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NL300*, NL303, NL400, NN302, EN300, ES300, ES410, EE331, EE332;
Mathematics: SM211, SM212;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204 and five electives;
Language: None;
Major: S1210, S1211, S1301, S1302, S1304, S1411, S1431, S1432, SM239, four major electives, and one mathematics elective.

*Taken during second class summer

"I'm really not that smart. I have to work at it. I don't fool around in class. I listen to the professor and I know how to study."

Computer Science Courses

SI180 Fundamentals of Computing (3–0–3). A first course in computing for all midshipmen. Introduction to current computer technology and applications, hardware and software building blocks of modern computer systems, and software development. A high-level language is used to teach the principles of software development.

SI200 Computer Applications and Impact (3–0–3). Survey of current information technology applications and issues. Emphasis is on microcomputer applications and gaining an appreciation for the problem-solving capability of automated systems. *Prereq: SI180 or equivalent.*

SI210 Introduction to Computer Science (3–0–3). Introduction to Algorithmic development, problem solving, and software design. Principles and concepts to provide foundation, knowledge, and experience upon which later computer science courses will build. The first course for computer science majors. *Prereq: SI100.*

SI211 Advanced Programming (3–0–3). Machine and assembly language, compilers and interpreters. Program segmentation and linking. Macros, sub-routines, and utility routines. Input/output, peripheral devices, and auxiliary storage. Program efficiency and documentation. *Prereq: SI210 or EE221 or ES201.*

SI301 Data Structures (3–0–3). Data representation and information management. Lists, strings, arrays, trees, and graphs. Storage structures, allocation, and collection. Sorting techniques, symbol tables, and searching. *Prereq: SI304.*

SI302 Fundamentals of Computer Logic (3–0–3). Applications of Booleán algebra to switching circuits, number representation, and logic networks. Minimization techniques. Analysis of fundamental computer circuits. *Prereq: SI211.*

SI304 Programming Languages (3–0–3). A study of formal language specification. Topics include data typing, program structure, sequencing, recursion, storage management, file interfacing, and translation and syntax. The implementation of features like runtime stacks, environmental tables, and parameter transmission are discussed in detail. *Prereq: SI301.*

SI305 Applied Algorithmic Processes (3–0–3). Use of top-down design and software engineering methodology to develop structured algorithms for problem-solving. A high-level language, such as FORTRAN or Ada, is used to implement the algorithmic designs. *Prereq: SI180 or equivalent.*

SI411 Operating Systems (3–0–3). The study of the operating system as a resource manager. Topics include process management, interrupt processing, memory management, deadlock handling, file systems, multiprogramming, multiprocessing, and data security and protection. *Prereq: SI211, SI301.*

SI412 Compiler Construction (3–0–3). Using formal programming language theory as a foundation, the issues of automata theory, program optimization, and language translation are examined. Sections of actual compilers are constructed to study the practical application of theory presented. *Prereq: SI211, SI301.*

"It wasn't until my last year that I finally saw how everything we do here contributed toward turning people into leaders."

SI420 Artificial Intelligence (3–0–3). A study of the fundamental concepts and techniques in the design and implementation of functionally intelligent machines. Topics include problem-solving using state-space search, problem-reduction techniques, game trees, general problem solver; and knowledge representation using production systems, first-order predicate calculus, and natural language. *Prereq: SI301.*

SI421 Discrete Simulation (3–0–3). Simulation and modeling of discrete systems. Introduction to queuing theory and stochastic processes. Comparison of simulation languages. Design, analysis, and validation of simulation models. *Prereq: SI304 and SM239* or *SI305.*

SI430 Fundamentals of Microcomputer Systems (3–0–3). Analysis and design of software systems for microprocessors. Includes characteristics and organization of microprocessors, peripheral interface software, and applications of software design. *Prereq: SI302*

SI431 Computer Organization (3–0–3). Organization, logic design, and components of digital computing systems. Overall organization of modules into a system. *Prereq: SI302.*

SI432 Computer Systems Management (3–0–3). Analysis, design, implementation, and evaluation of computer information systems, including discussion of hardware, software, and management issues. *Prereq: SI431.*

SI440 Database Organization (3–0–3). Topics include database systems architecture, the various approaches to database organization including relational, hierarchical, and network models; normalization, and implementation issues. *Prereq: SI301.*

Department of Mathematics

Mathematics Major

The major in Mathematics gives students the opportunity to acquire a sound mathematical foundation and to develop facility in applying mathematical concepts and techniques. The program permits a concentration in mathematics, operations analysis, or computer science plus a choice of electives in physics, engineering, and economics. A solid background in mathematics facilitates post-graduate specialization in many technical areas, including nuclear power. An undesignated Bachelor of Science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, EN200, NS252, NS300*, NL303, NN302, EN300, ES300, EE311–312, ES400, NL300*, NL400;
Mathematics: SM201 or SM211 or SM251, SM212, SM239, SM261, SM331, SM332;
Science: SP211, SP212, and one science/engineering elective;
Humanities/Social Sciences: HE300*, HH204, and five electives;
Language: none;

Special: one free elective;
Mathematics concentration: SM362, plus three additional mathematics courses (two of which must be at the 400 level) chosen from SM242, SM259, SM269, SM311, SM312, SM315, SM364, SM411, SM425, SM426, SM433, SM461, SM462, SM464, SM465, SM468;

Operations Analysis concentration: SA401 and SA441, plus three electives chosen from SA402, SA410, SA412, SA430, SA442;

Computer Science concentration: SI210 and SM425 or SM426, plus three courses chosen from SI211, SI301, SI302, SI304, SI411, SI412, SI420, SI421, SI430, SI431, SI440.

*Taken during second class summer

"I never had to study in high school. Never . When I first came in here I didn't know what to do, like one step forward, two steps back."

Physical Science Major

The major in Physical Science gives students the opportunity to pursue a broad, scientifically-oriented program in the field of physical applications of mathematics and science. The major permits midshipmen to experience an interdisciplinary technical course without the need for specialization. An undesignated Bachelor of Science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, EN200, NS252, NS300*, NL303, EN300, ES300, EE311–312, ES400, NL300*, NL400;
Mathematics: SM201 or SM211, SM202 or SM212;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204 and five elective courses;
Language: none;
Special: none;
Major: SO211, SO341, SP301, SP411; two electives from math/computer science; two electives from science/engineering; and three from science/mathematics/engineering/computer science.

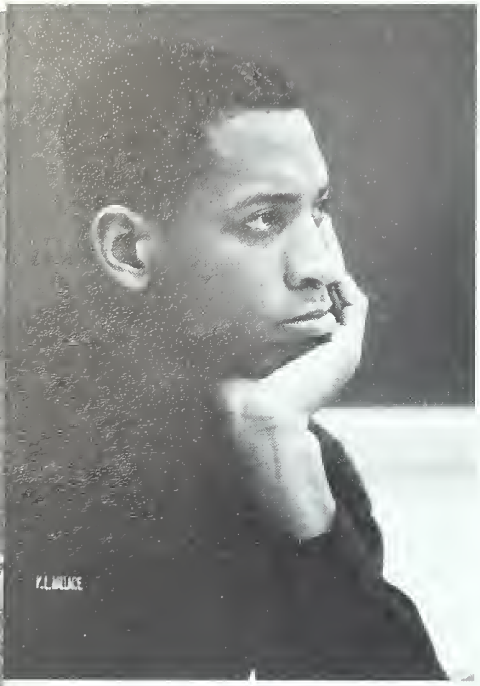
*Taken during second class summer

Mathematics Courses

SM005 Pre-Calculus Mathematics 4–0–4). Basic review of algebraic and arithmetic operations, analysis of functions and their graphs, and trigonometry. This course does not fulfill any of the mathematics requirements of any major and may be required in addition to stated graduation requirements for certain midshipmen. *Prereq: permission of department chairman.*

SM100 Introduction to Analytic Geometry and Calculus I with Trigonometry (5–0–5). Same as SM101 plus trigonometry.

SM101 & SM102 Introduction to Analytic Geometry and Calculus I & II (4–0–4, 4–0–4). Course content similar to SM111 and SM112. For those not qualified to enroll in SM111.



"I was told that if you were serious about the Navy, the Naval Academy was the place to go."

SM111 & SM112 Calculus and Analytic Geometry I & II (4–0–4, 4–0–4). Plane analytic geometry; differential and integral calculus of one real variable.

SM161 & SM162 Calculus with Computers I & II (5–0–5, 5–0–5). Programming using BASIC, algorithmic development of the integral and differential calculus of one real variable. *Prereq: permission of department chairman.*

SM201 Analytic Geometry and Calculus III (4–0–4). Course content same as SM211 plus material to strengthen the background of students completing SM102. *Prereq: SM102 and SI100 or permission of department chairman.*

SM202 Elements of Differential Equations (3–0–3). Course content same as SM212 except for material on the Laplace transform. *Prereq: SM201, SM211 or SM251.*

SM211 Calculus and Analytic Geometry III (3–0–3). Solid analytic geometry, series, partial differentiation, and multiple integration. *Prereq: SM112 or SM162; SI100 or equivalent.*

SM212 Differential Equations (4–0–4). Linear and simultaneous differential equations; solution by Laplace transform and series; partial differential equations and Fourier series. *Prereq: SM201 or SM211 or SM251.*

SM219 Probability and Statistics (3–0–3). Nature of statistical methods, description of data, probability, distributions, sampling, estimation, testing hypothesis, correlation, and regression. Computer methods emphasized. Credit cannot be given for SM219 if credit has been given for SM239. *Prereq: SM102 or SM112 or SM162; SI100 or equivalent.*

SM230 Introduction to Probability and Statistics (3–0–3). An elementary treatment of the basic concepts of probability models and statistical inference. Sample spaces, discrete and continuous random variables, standard distributions, central limit theorem, sampling, statistical inference. Credit cannot be given for SM230 if credit has been given for SM239. *Prereq: SM102 or SM112 or SM162.*

SM239 Probability and Statistics I (3–0–3). A more rigorous treatment of material in SM230 for advanced work in mathematics, operations research, science, and engineering. *Prereq: SM201 or SM211 or SM251.*

SM242 Discrete Mathematics (3–0–3). Introduction to combinatorial analysis and graph theory. Applications to problems in enumeration, matching, network analysis, optimization, scheduling, searching, and sorting. *Prereq: SM102 or SM112 or SM162.*

SM251 Calculus with Computers III (4–0–4). Course content includes and extends that of SM211 with extensive computer applications. *Prereq: SM162.*

SM259 Mathematical Logic (3–0–3). Mathematical languages, formal logic, propositional calculus and truth tables, first order predicate calculus, proof theory, axiomatic systems, and model theory. Applications to logical networks and nonstandard analysis. *Prereq: SM102 or SM112 or SM162.*

SM261 Matrix Theory (3–0–3). Matrices, transformations, linear equations, vector spaces, characteristic matrix, eigenvalues, orthogonality. *Prereq: SM102 or SM112 or SM162.*

SM264 Introduction to Numerical Analysis (3–0–3). Polynomial approximations, iterative methods for solving equations, systems of linear equations, numerical integration, interpolation, curve fitting. Computer methods emphasized. *Prereq: SM102 or SM112 or SM162; SI100 or equivalent.*

SM269 Probability and Statistics II (3–0–3). Estimation, confidence intervals, tests of hypothesis, Baynesian methods, least squares, regression. *Prereq: SM239.*

SM270 Introduction to Mathematical Economics (3–0–3). Equilibrium analysis, models, theory of the multiplier, acceleration principle, optimization, and linear differential and difference equations. *Prereq: SM261.*

SM271 Linear Programming (3–0–3). Simplex and dual simplex methods, minimax theorem, transportation problems, and game theory. *Prereq: SM102 or SM112 or SM162; SI100 or equivalent.*

SM281 Vector Analysis (3–0–3). Vector algebra, vector calculus, fields, line and surface integrals, Stokes and Gauss theorems. *Prereq: SM201 or SM211 or SM251.*

SM311 Engineering Mathematics I (3–0–3). Vector analysis, Fourier analysis, partial differential equations, Sturm-Liouville problems, Legendre polynomials, determinants, and matrices. *Prereq: SM212.*

SM312 Engineering Mathematics II (3–0–3). Laplace and Fourier transforms, selected topics from complex variables. *Prereq: SM212.*

SM315 Introduction to Partial Differential Equation (3–0–3). Linear equations, Cauchy problems, Laplace and Poisson equations, boundary value problems, heat equations. Sturm-Liouville problems, and orthonormal expansions. *Prereq: SM212.*

SM331 Advanced Calculus I (4–0–4). Real number system, topology of Euclidean space, continuity and differentiability of a function of one variable, differentiable transformations between Euclidean spaces. *Prereq: SM261.*

SM332 Advanced Calculus II (4–0–4). Mean value and Taylor's theorems for functions of several variables, inverse and implicit function theorems, extremal problems, integration, multiple integrals, uniform convergence. *Prereq: SM331.*

SM362 Modern Algebra (3–)–3). Integers, groups, mappings, rings, fields. *Prereq: SM102 or SM112 or SM162.*

SM364 Applied Numerical Analysis (3–0–3). Numerical approximation methods for single variable nonlinear equations, systems of linear equations, ordinary differential equations, and polynomial interpolation with attention to accuracy, stability, and computer implementations. More rigorous treatment given in SM425 and SM426. *Prereq: SM212, SM261.*

SM400 Mathematics for Nuclear Power (4–0–4). Mathematics for nontechnical majors preparing for the Navy's Nuclear Power Program. Topics selected from SM212 and SM311. *Prereq: 1/C and SM202.*

SM411 Introduction to Complex Variables (3–0–3). Algebra and topology of complex numbers. Elementary functions. Complex derivative and integral. Theorems of Cauchy. Analytic functions, conformal nappings, Taylor and Laurent series, singularities, residue theory, analytic continuation. Applications to real analysis and physical problems. *Prereq: SM331.*

SM425 Advanced Numerical Analysis (3–0–3). Numerical solution of equations in one and several variables, direct and iterative algorithms, rate of convergence. Computer methods emphasized. *Prereq: SM331 or permission of instructor.*

SM426 Numerical Methods for Differential Equations (3–0–3). Interpolation and polynomial approximation, numerical integration and differentiation, numerical algorithms for initial value, and boundary value problems. *Prereq: SM212, SM331 or permission of chairman.*

SM433 Methods of Applied Mathematics (3–0–3). A course of selected topics in applicable mathematics built upon students' prior studies in linear algebra (SM261) and analysis (SM331). A few topics are chosen from such subjects as linear operator theory, calculus of variations, integral equations, transform methods, tensor calculus, and distribution theory. Areas of application include physics, engineering, systems engineering, and operations analysis. *Prereq: SM331 or permission of chairman.*

SM461 Linear Algebra (3–0–3). Vector spaces, linear transformations, Jordan canonical form, inner product spaces. *Prereq: SM261, SM331.*

SM462 Algebraic Structures (3–0–3). Groups, rings, fields, Galois theory. *Prereq: SM262, SM331.*

SM464 Topology (3–0–3). A mathematical analysis of such surfaces as the sphere, torus, Klein bottle, and Mobius strip. To develop an intuitive feel for the subject, a visual approach is used and many examples are investigated. *Coreq: SM332.*

SM465 Advanced Differential Equations I (3–0–3). Existence, uniqueness and oscillation theorems, stability, topological methods. *Coreq: SM332.*

SM468 Measure and Integration (3–0–3). Construction, properties and extensions of measures, Lebesque-Stieltjes measures, integrals, Fubini and Nikodyn theorems, Daniell integral, relation to probability theory. *Prereq. SM332.*

"I never thought I'd say this, but Saturday night is really a good time to study. A lot of mids do just that."

Operational Analysis Courses

SA302 Analysis of Naval Tactics (3–2–4). An introduction to the techniques of modeling and quantitative analysis applied to specific naval operational problems, including search and patrol, screening, anti-air warfare, mining, equipment reliability, and decision rules. *Prereq: SM239 or SM230.*

SA401 Methods of Operations Analysis I (3–0–3). Investigation of fundamentals of linear optimization subject to constraints, including construction and analysis of linear programming and network problems. *Prereq: SM261.*

SA402 Methods of Operations Analysis II (3–0–3). Investigation of quantitative analysis of decision options, including PERT/CPM, dynamic programming, Markov chains, and queuing theory. Applications to typical operations are stressed. *Prereq: SM239, SM261.*

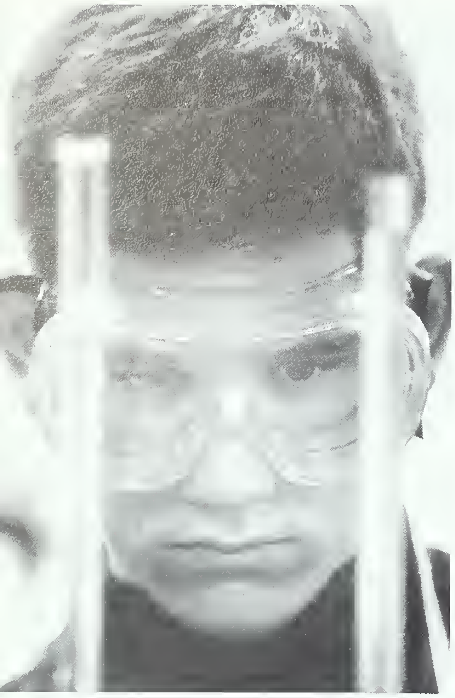
SA410 Selected Techniques in Operations Analysis (3–0–3). Application of probability and deterministic models to analysis of operational problems. *Prereq: SM230 or SM239.*

SA412 Applications of Operations Analysis (2–2–3). Operations research techniques are applied using student projects, case studies, and visiting lecturers. Topics include current military and industrial problems. *Prereq: permission of chairman.*

SA430 Logistics (3–0–3). Investigates techniques of operations analysis applicable to the solution of problems in realiability, maintainability, availability, and inventory. *Prereq: SM239 and SA401.*

SA441 Applied Statistics I (3–0–3). An applied study of a variety of statistical methods used in obtaining, presenting, summarizing, and analyzing statistical information. Included are strategies for data collection and presentation, and techniques of statistical inference for population, parameters based on the concepts of sampling, probability, and distribution theory. *Prereq: SM239.*

SA442 Applied Statistics II (3–0–3). A continuation of SA441 that includes examination, evaluation, and application of advanced statistical methods. Techniques studied include sampling, nonparametric analysis, simple and multiple regression, correlation, analysis of variance, and decision theory. *Prereq: SA441.*



"The Academy wasn't as tough physically as I expected, but academically it's ridiculously hard. I have to study about 35–40 hours per week."

Department of Chemistry

Chemistry Major

Chemistry, an experimental science, is the most laboratory-oriented program offered at the Naval Academy. Serious students of chemistry have ample opportunity to experiment and observe as they pursue the scientific method. Laboratory equipment includes Fourier transform infrared spectrometer, Fourier transform nuclear magnetic resonance spectrometer, laser raman spectrometer and mass spectrometer/gas chromatograph, among other modern equipment.

Any naval officer will profit from a good knowledge of chemistry. A background in the fundamental principles of chemistry and modern experimental techniques is highly valuable for officers working in such technical subspecialties as oceanspace research, life sciences and support systems, propellants, and many others.

The Chemistry major is accredited by the American Chemical Society. Bachelor of Science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, NI200, EN200, NS252, NS300*, NL303, NN302, EN300, ES300, EE311–312, ES400, NL300*, NL400;
Mathematics: SM211, SM212;
Science: SP211, SP212
Humanities/Social Sciences: HE300*, HH204 and five electives;
Language: none;
Special: none;
Major: SC201, SC202, SC301, SC302, SC304, SC321, SC322, SC401, SC402L, and three chemistry electives.

*Taken during second class summer

Chemistry Courses

SC103 & SC104 Elements of Chemistry (3–2–4, 3–2–4). A two-semester sequence presenting the fundamental laws and theories of chemistry. Atomic and molecular structures, periodicity, chemical equilibrium, kinetics, and electrochemistry are covered in a balanced classroom and laboratory approach for the student with a limited chemistry, mathematics, and science background.

SC105 & SC106 General Chemistry (3–2–4, 3–2–4). A two-semester sequence stressing the fundamental laws and theories of chemistry. Topics include atomic and molecular structures, bonding, chemical thermodynamics, equilibrium, kinetics, acids and bases, and electrochemistry. Laboratory emphasis is on development of scientific laboratory skills, particularly the generation, analysis, and presentation of data.

SC113 & SC114 Principles of Chemistry (3–2–4, 3–2–4). (Honor) Rigorous courses in the fundamental principles underlying the areas of inorganic, organic, and physical chemistry designed for students with above average ability in the sciences. *Prereq: one year of high school chemistry.*

SC201 & SC202 Organic Chemistry (3–6–5, 3–6–5). The chemistry of covalent compounds of carbon, including aromatic, aliphatic, and heterocyclic. The second semester laboratory includes qualitative organic analysis. Special attention is given areas of petroleum, plastics, drugs, and spectroscopy. *Prereq: SC114 or SC106 or SC104.*

SB251 General Biology I (3–2–4). Fundamental principles are introduced. Topics include protoplasm, plant and animal histology, plant and animal metabolism, gametogenesis, and cell division, as well as genetics, ecology, and organic evolution.

SB252 General Biology II (3–2–4). Expands upon topics from General Biology I, particularly plant and animal metabolism, and introduces vertebrate morphology and physiology.

SC301 & SC302 Physical Chemistry (3–0–3, 3–0–3). An introduction to the physical states of matter, kinetic theory of gases and liquids, thermodynamics, phase equilibria, properties of solutions, atomic and molecular structure. *Prereq: SM211, SP212.*

SC304 Instrumental Methods of Analysis (2–6–4). The theory and applications of modern instrumental methods of analysis are stressed. A wide array of sophisticated instruments is available for student use. *Prereq: SC301, SC321.*

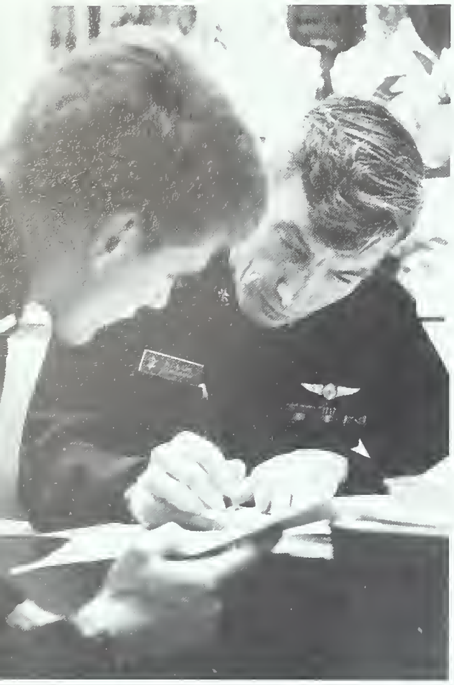
SC321 Quantitative Analysis (2–6–4). A study of volumetric, gravimetric, and modern optical and electrical methods of analysis. Theory and laboratory procedures and techniques are stressed. *Prereq: SC114 or SC106.*

SC322 Inorganic Chemistry (3–0–3). An in-depth study of fundamental concepts, including topics in atomic structure, chemical bonding, and coordination chemistry. *Prereq: SC302.*

SC401L & SC402L Physical Chemistry Laboratory (0–3–1, 0–3–1). A comprehensive, sophisticated laboratory course designed to give practical laboratory experience in the areas covered in courses SC301 and SC302. *Prereq: SC302, SC321.*

SC432 Biochemistry (3–0–3). The biological chemistry of the human body is discussed, including both normal and abnormal aspects. Metabolism, nutrition, vitamins, and hormones are included. *Prereq: SC201.*

"I wanted to go to the Naval Academy because I thought it would be a challenge and I was curious whether I could handle it. I feel good about myself and what I've accomplished here."



"My high school preparation was poor and my study habits left a lot to be desired. It took a whole semester to learn how to study."

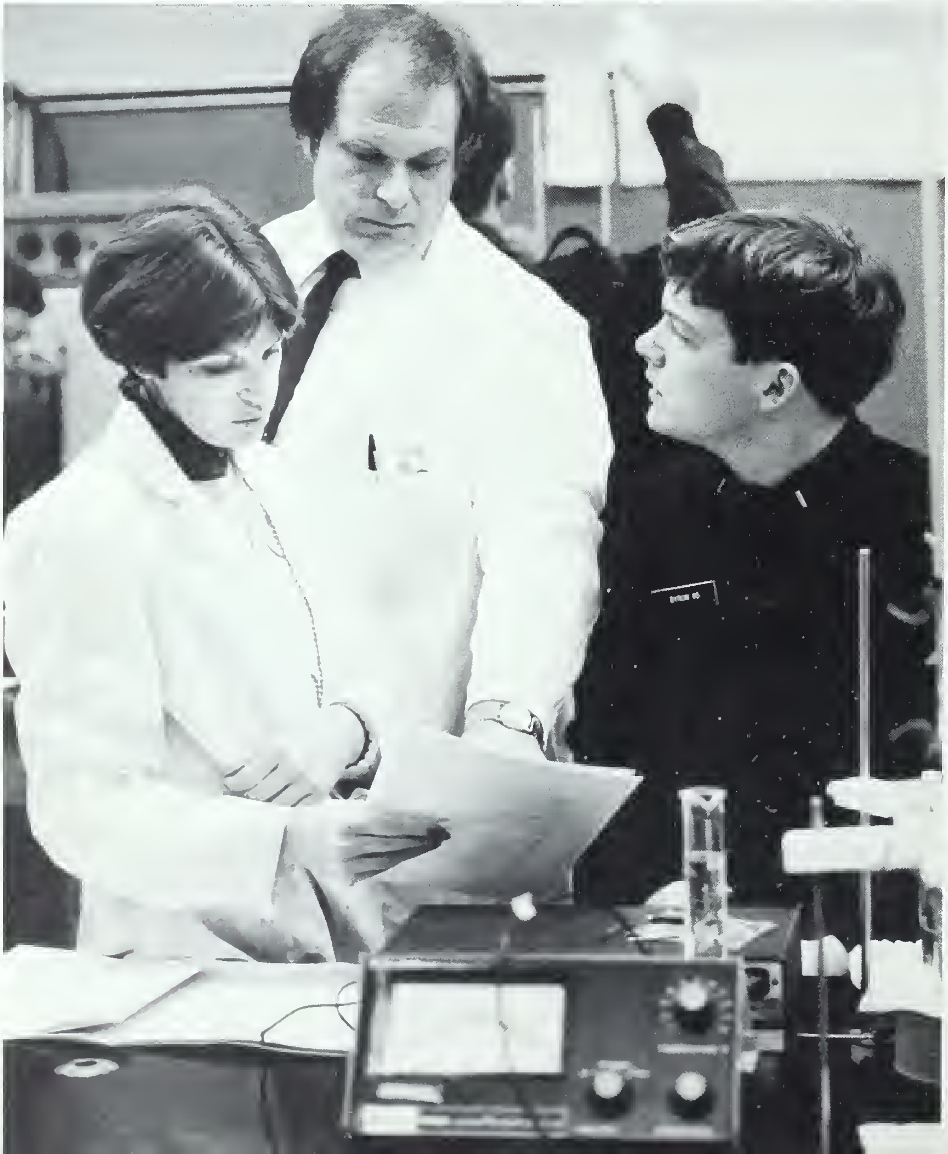
Department of Oceanography

Oceanography Major

Oceanography is an interdiciplinary science major involving the study of meteorology, geophysics, physics, chemistry, biology, and geology as they relate to the ocean environment and the effects of that environment on naval operations. It is a laboratory-oriented program with the most modern facilities, including an oceanographic research vessel, a field laboratory, a weather station and radiosonde system for study of the atmosphere, plus a wave tank, a rotating tank, demonstration tank, atmospheric chamber, tide gauges, marine culture systems, and fully equipped laboratories. An undesignated Bachelor of Science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NL303, NN302, EN300, ES300, EE311–312, ES400, NL300*, NL400;
Mathematics: SM201 or SM211, SM212, SM311;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204 and five electives;
Language: none;
Special: none;
Major: SB251, SO261, SO313, SP328, SO342, SO413, SO424, SO472, and SP411 plus two approved major electives.

*Taken during second class summer



Oceanography Courses

SO211 Introductory Oceanography (3–0–3). An introductory course designed for Physical Science majors, treating physical and chemical properties of sea water, submarine geology, marine biology, the heat budget of the oceans, water masses and general circulation, currents, waves, and tides. *Prereq: SC104, SC106, or SC114; SP212.*

SO221 Introduction to Oceanography (3–0–3). A descriptive course designed for the Ocean Engineering major to provide an overview of significant oceanographic factors and their impact on engineering applications. *Prereq: SC104, SC106, or SC114; SP211; SM201 or SM211.*

SO261 Physical Geology (3–2–4). A study of the dynamic Earth, centered around the concept of global plate tectonics, with emphasis on the materials, form, and structure, and particularly the internal and external processes which shape the Earth and affect its inhabitants.

SO313 General Oceanography (3–2–4). Beginning physical oceanography, the ocean basins, age and origin of oceans, physical properties of sea water, chemical properties of water and ice, distribution of variables, and physical characteristics of estuaries. Ocean current systems, water masses, motion-producing forces, heat budget, heat distribution and thermal structure, waves, tides, and marine biology. Laboratory work includes a field trip and oceanographic surveys of Chesapeake Bay. *Prereq: SB251, SO261; SC106 or SC114; SP212; SM201 or SM211.*

SO341 General Meteorology (3–0–3). An introductory study of the atmosphere including radiation, weather patterns and phenomena, atmospheric motion, and the effects of weather on naval operations. *Prereq: SM201 or SM211; SP211.*

SO342 Principles of Meteorology (3–2–4). A study of the thermodynamics of the atmosphere with respect to wind, temperature, and moisture processes. Introduces the basic techniques of meteorological observation and the use of meteorological charts. *Prereq: SM201 or SM211; SP211.*

SO413 Oceanic and Atmospheric Processes (3–0–3). The dynamics of quasi-horizontal, inviscid flow on the rotating earth. The motions of interest are isolated through the use of scale analysis of the governing equations. *Prereq: SO313, SO221, or SO211; SO342.*

SO415 Environmental Pollution (2–2–3). Concerns environmental problems involving air and water. Topics include pollution sources and control, hydrology, solid wastes, recycling, noise, and legal aspects. Laboratory work includes field trips and pollution surveys. *Prereq: SO313, SO221, or SO211; SO342.*

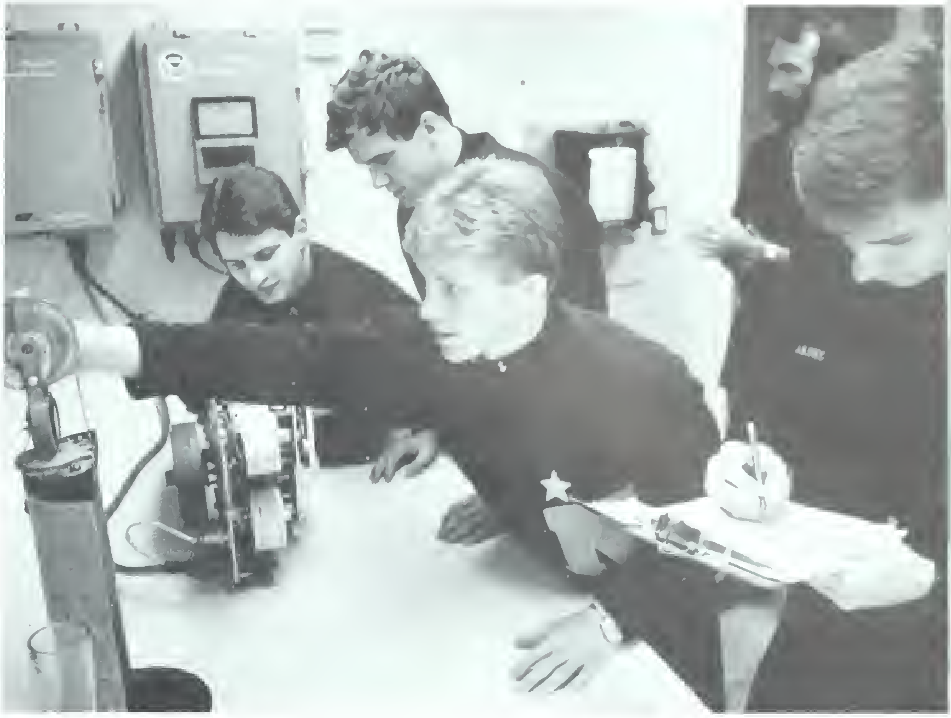
SO422 Nearshore Oceanography (2–2–3). Examines the oceanographic regime from the continental break to the intertidal zone, concentrating on shallow water wave, surf, and beach processes. *Prereq: SO313, SO221, or SO211.*

SO424 Waves and Tides (3–0–3). The dynamics of surface and internal wave phenomena in the oceans and atmosphere and an examination of wind-generated wave characteristics and prediction methods. *Prereq. SO413.*

SO425 Principles of Remote Sensing (3–0–3). Introduces the physical bases of remote sensing and examines applications of environmental remote sensing data in oceanography, meteorology and earth sciences. *Prereq: SO211, SO221, or SO313; SO342.*

SO441 Synoptic Meteorology (2–2–3). A practical course in meteorological analysis and forecasting as applied to operational planning. *Prereq: SO342.*

SO4444 Climatology (3–0–3). A climatic approach to weather phenomena. *Prereq: SO342, SO313, SO221, or SO211.*



SO445 Air-Sea Interaction (2–2–3). Develops an understanding of the mass and energy transfer processes between the ocean and atmosphere, and how these processes affect the vertical wind profile. Lab work involves reducing and analyzing boundary layer measurements. *Prereq: SP328, SO313; SO342.*

SO451 Biological Oceanography (2–2–3). An introduction to the ocean as a biological environment. Laboratory work includes practical studies of the biology of the Chesapeake Bay. *Prereq: SB251, SO313, SO221, or SO211.*

SO452 Applied Biological Oceanography (2–2–3). A study of the biological phenomena which affect naval operations. Significant biological and chemical processes are analyzed in the laboratory. *Prereq: SO451.*

SO461 Geological Oceanography (2–2–3). Introduction to marine geological instrumentation, theory and data gathering, analysis, interpretation, and applications. Geomorphology, structure, petrology, sedimentation, stratigraphy, origin, and development of ocean basins and margins are examined in light of theory of plate tectonics. Practical studies of the Chesapeake Bay are part of the laboratory work. *Prereq: SO261; SO313, SO221, or SO211.*

SO463 Current Topics in Oceanography and Meteorology (3–0–3). Provides an opportunity to present current material pertinent to oceanography and meteorology and their application to areas of Navy interest. Not offered every year. *Prereq: oceanography major or chairman approval.*

SO471 Chemical Oceanography (2–2–3). The modern approach to the ocean as a chemical system. Laboratory instruction emphasizes principles with appropriate methods. Classical concepts are discussed, as well as newer trends. Not offered every year. *Prereq: SO313, SO221, or SO211.*

SO472 Environment Applications and Issues (2–2–3). A capstone course for oceanography majors. This course focuses on fundamental technical issues created by regional environments, assesses the impact of the environment on operational systems, and exposes the student to issues of national management policy with an environmental aspect or impact. Guest lecturers. *Prereq: I/C oceanography major.*

> *"Control of the seas means security. Control of the seas means peace. Control of the seas can mean victory. The United States must control the sea if it is to protect our security."*
>
> JOHN F. KENNEDY

"The classes are tough and you've always got so much else to do. You're constantly behind, you have to get everything done, and you have to organize everything to get the most out of every minute. Time is very precious here."

Department of Physics

Physics Major

The major program in Physics presents fundamental physical concepts and principles in such a way as to emphasize their general usefulness, and lays a strong foundation for further work in a broad range of technical fields. Some of the topics treated in the sequence of courses are the origin, propagation, and reception of waves of all kinds; field concepts; theory of relativity; basic theory of quantum mechanics; and statistical mechanics. All are studied with the object of developing an open-minded and creative approach to the physical world—an approach increasingly important to those who will be leaders in the modern Navy. A solid background in physics achieved at the Academy will facilitate subsequent specialization in any technical area. Bachelor of Science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NL303, NN302, EN300, ES300, ES400, NL300*, NL400;
Mathematics: SM211, SM212, SM311;
Humanities/Social Sciences: HE300*, HH204 and five elective courses;
Language: none;
Special: none;
Major: SP221, SP222, SP226, SP324, SP331, SP332, SP341, SP425, SP444, plus two physics electives and one elective from engineering, science, or mathematics.

*Taken during second class summer

Physics Courses

SP211 & SP212 General Physics I & II (3–2–4, 3–2–4). Emphasizes the fundamental principles of classical physics; however, contemporary applications are introduced as appropriate. The topics covered are mechanics, electricity, magnetism, wave motion, sound, and light. *Prereq: Calculus II for SP211; SP211 for SP212.*

SP221 Physical Mechanics I (3–2–4). The first course in physics for majors in physics. This course provides the basic classical mechanics for further study in physics. *Prereq: SM111 or approval of department chairman.*

SP222 Electricity and Magnetism I (3–2–4). A first course in electricity and magnetism with emphasis on the concepts of fields and potential. The course culminates in the formulation of Maxwell's equations. *Prereq: SP221 or SP211.*

SP226 Heat, Sound, and Light (3–2–4). Develops the basic concepts in heat, sound, and light. This course completes the three-course sequence in physics, SP221, SP222, and SP226. *Prereq: SP211 or SP221*

SP301 Modern Physics (3–0–3). An introduction to relativistic mechanics and the particle aspects of electromagnetic radiation. Emphasis on the decay of unstable nuclei and nuclear reactions. *Prereq: SP212 or SP226.*

SP310 Astronomy (3–0–3). The fundamentals of astronomy as a physical and mathematical science, covering the solar system, stellar and galactic astronomy, and cosmology. *Prereq: SP212 or SP226.*

SP324 Physics of the Atom I (3–2–4). A first course in atomic and nuclear physics for majors in physics. Topics covered are black body radiation, photon theory of radiation, development of Rutherford and Bohr atoms, wave properties of matter, the Schrodinger wave equation, and quantum theory of hydrogenic atoms. *Prereq: SP331, SM212, Coreq: SM311 or permission of the instructor.*

SP328 Fluid Physics (3–0–3). A first course in classical fluid mechanics which addresses the fundamentals of inviscid, incompressible flow dynamics, circulation, vorticity, and turbulent flow. *Prereq: SP212, SM311, and SO313 or permission of department chairman.*

SP331 Physical Mechanics II (3–0–3). A first course in physical mechanics at the intermediate level. Newtonian and Lagrangian mechanics with special emphasis on the central force problem and noninertial reference frames. *Prereq: SP221 or SP211; SM212.*

SP332 Physical Mechanics III (4–0–4). A continuation of Physical Mechanics II, with emphasis on special relativity, oscillating systems, and the mechanics of both rigid and deformable bodies. Introduction to variational principles. *Prereq: SP331.*

SP341 Electricity and Magnetism II (3–0–3). A course in electromagnetic theory required for all majors in physics and electrical engineering. Maxwell's equations are formulated in the notation of vector analysis and applied to various situations. *Prereq: SP222; Coreq: SM311.*

SP411 Underwater Acoustics and Sonar (3–0–3). A fundamental study of sound propagation in the ocean environment as it relates to the design and operation of sonar. *Prereq: SP212 or SP226.*

SP425 Physics of the Atom II (3–2–4). The formalism of quantum mechanics. Quantum theory of angular momentum; application to specific heats of gases, hydrogenic atoms. Quantum treatment of multi-electron atoms; applications to atomic and molecular spectra, solids, quantum statistics. Introduction to nuclear physics. *Prereq: SP324, SM311.*

SP434 Nuclear Physics (3–2–4). A study of the basic static and dynamic properties of the nucleus and of the interaction of particles and radiation with matter. Emphasis on the experimental techniques. Where appropriate, quantum mechanical interpretations of the phenomena are given. *Prereq: SP425.*

SP436 Acoustics (3–2–4). An introduction to modern acoustics. The topics included are normal modes and boundary-value problems; discrete Fourier transform; radiation, transmission, and detection of sound waves; electro-acoustics, physcho-acoustics, architectural

acoustics, and underwater acoustics. *Prereq: SP211 or SP221 and SM212.*

SP438 Optics (3–2–4). An introduction to modern optics. The topics included are polarization, interference, coherence, diffraction, Fourier transforms, holography, optics of solids, and basic laser physics. *Prereq: SP341.*

SP440 Solid State Physics (3–0–3). An introductory course in physics of the solid state. The topics included are crystal structures, thermal properties, free electron model, band theory, magnetism resonance, and semiconductors. *Prereq: SP324.*

SP444 Thermal Physics (3–0–3). A presentation of topics in thermal physics from the statistical viewpoint. *Prereq: SP425 or permission of the department chairman.*

SP445 Stellar Astrophysics (3–0–3). A study of the basic physics of stellar properties or processes: mass, luminosity, stellar spectra, chemical composition, stellar energy sources, nucleosynthesis, stellar models, and stellar evolution. *Prereq: SM212, SP301, or SP324; SP310 or permission of instructor.*

"The best opportunity at Annapolis is to learn to work with people."

D.M.QUINT

Division of English and History

Department of English
Department of History

Department of English

English Major

The major program in English offers study of the most significant and influential writings of civilization from ancient times to the present, as well as the opportunity for independent study and for creative writing projects. A special feature of the program is that the literature of virtually all major countries and cultures is considered, in contrast to traditional offerings which are normally restricted to British and American literature. An undesignated Bachelor of Science degree is awarded. An honors program with a designated "honors" degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, SN300*, NL303, NN302, EN300, ES300, EE311-312, ES400, NL300*, NL400;
Mathematics: SM201, SM202 or SM211, SM212;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, and three elective courses;
Language: Four semesters of a modern language;
Special: none;
Major: HE333 plus nine approved major electives.

*Taken during second class summer

"I never really thought about being one of a few women at the Academy until I got here . By the time I entered, women were in all the upper classes and they were proving themselves in leadership positions."

English Courses

HE101 Practical Writing (3-0-3). The study and practice of grammatically correct and rhetorically effective expository prose, supplemented by the analysis of essays by professional writers. For students selected by English Department.

HE111-112 Rhetoric and Introduction to Literature I & II (3-0-3, 3-0-3). Stresses the writing of rhetorically effective and grammatically correct expository prose. During the first semester, students read essays, short stories, and plays, and they write brief essays (up to 500 words). During the second semester, students read novels and poetry and write longer essays.

200-Level Courses: General Description

The literary content of courses on this level is eclectic. These courses offer wide surveys of materials from different cultures, historical periods, literary types, and issues. In each course, substantial practice in writing is to be expected. If a term paper is required, prior to the submission of such a paper there will also be several essays or written exercises to test and evaluate the student's writing competence. There are no prerequisites for any course in the 200 group. They may be taken at any class level, including the fourth class year.

HE219 The Literature of Classical and Christian Ideas (3-0-3). The foundations of modern literature of classical Greece and Rome and medieval Europe. Readings in mythology, philosophy, the epic, drama, and poetry. Attention will be given to the traditions, ideas, and conventions which have shaped the development of Western literature.

HE222 The Bible and Literature (3-0-3). Studies in the Bible and its influence on European and American literature. Emphasis will be placed on modern Biblical literary-critical methodology and on the symbolic richness of derivative literature from Dante to Bernard Malamud.

HE223 Modern World Literature (3-0-3). Readings in the literature of contemporary cultures throughout the world, notably the literature of the current world scene as it will be experienced by the modern professional officer.

HE224 Literature and Science (3-0-3). The interrelationships among science, technology, and literature since the Renaissance. The impact of science on literature and the implications of science as reflected in literary responses.

HE240 American Black Literature (3-0-3). Provides a generic survey of representative American black literature. Major figures including Toomer, Hughes, Wright, Ellison, Baldwin, Baraka, Brooks, Hayden, and Morrison are stressed as the genres of short fiction, poetry, drama, and the novel are covered.

HE250 Literature of the Sea (3-0-3). Study of the principal genres of the literature of the sea (an epic, novels, shorter fiction, and poetry). Emphasis on literary qualities, man's relationship with the sea, and problems of command.

HE260 Introduction to Mass Media (3-0-3). An introduction to the mass media, their history, freedoms and responsibilities, operations and functions, trends, audiences, and effects on the individual and society. Each major medium and various ancillary functions are examined.

"It was snowy and bleak, no leaves on the trees . . . I went to a class and saw a closeness between the professor and student—an English class, not my best subject—but it was informal and I learned a lot just sitting there. That impressed me."

300-Level Courses: General Description

These courses build on the foundations of literary analysis, comprehension, and writing acquired in HE111–112. The HE301–306 series goes more deeply into each of the basic literary types; the HE313–333 series approaches literature in its historical-cultural dimension while focusing on a limited historical period; the HE343–344 series offers extensive practice in a variety of writing forms. All courses, however, have a writing requirement intended to further the student's opportunity to improve skills. Prerequisites for all 300-level courses are HE111–112.

HE300* Public Communication (1–0–1). Introduction to the junior officer's role in Navy public affairs. Practice in speaking in various situations. Taken during 2/C summer.

HE301 Patterns in Drama (3–0–3). Reading, viewing, and analysis in a variety of dramatic experiences for the purpose of exploring the relationships among language, action, and form.

HE302 Forms of Poetry (3–0–3). An examination of the variety of techniques by which language is shaped into poetry. The focus is on analytic methods for understanding poetry.

HE306 Types of Fiction (3–0–3). Ideas and issues of modern fiction, with particular emphasis on the conventions, techniques, forms, and innovations of the novel and short story.

HE313 Chaucer and His Age (3–0–3). The literary and philosophical traditions within which Chaucer and his contemporaries worked. Readings in Chaucer's works, the Gawain poet, and others, including early and late medieval writers from England and the Continent.

HE314 The Renaissance Mind (3–0–3). Literature and thought of the period bracketed by the two great English epics, Spenser's *Fairie Queene* and Milton's *Paradise Lost*. The course includes a continental perspective, with readings from such authors as Machiavelli, Rabelais, Cervantes, Montaigne, and Castiglione.

HE315 Satire and Sensibility in the Age of Reason (3–0–3). The literature of the "enlightenment" (1660–1780). Reading in the prose and poetry of Dryden, Swift, Pope, Addison and Steele, Johnson, and Boswell as well as selected novels and such continental writers as Voltaire.

HE317 The Romantic Vision (3–0–3). Concentrates on how writers from 1798 to 1837 responded to the growth of industrialism, religious skepticism, nationalism, and a host of other problems associated with modern life. Readings in representatives of the Romantic period. Reading in such continental writers as Goethe and Novalis may be included.

HE318 Modern British Literature (3–0–3). The literature of Great Britain and Ireland of the past hundred years. The novels of Hardy, Conrad, Joyce, Lawrence, Golding, and Lessing; the plays of Shaw, Synge, O'Casey, and Pinter; the poetry of Yeats, Eliot, Auden, and Dylan Thomas.

HE319 The Victorian Frame of Mind (3–0–3). A study of the literature of England written during the last seven decades of the 19th century, during the reign of Queen Victoria. Emphasis on the writings that deal with the growth of religious skepticism, the rise of the middle class, general education, and the increasing dehumanization of the individual in a society caught up in a new wave of scientific discovery and technological progress. Readings from representative figures such as Dickens, George Eliot, Hardy, Tennyson, Browning, Arnold, Ruskin, Carlyle, and Darwin.

HE326 Literature of the American Dream, 1620–1860 (3–0–3). A survey of American literature from the time of the Pilgrims to the outbreak of the Civil War. Emphasis is on the relationship between the emerging culture and literature.

HE328 America's Literary Coming of Age (1860–1920) (3–0–3). A study of American literature from the Civil War to the development of the United States as a major industrial and military political power after World War I. Focus of the course is on the American writer's response to his own culture and to that of his broadening world.

HE329 Modern American Literature: The 20th Century Challenge (3–0–3). A study of American literature from 1910 to 1945 with emphasis on the writer's interpretation of the complexities of 20th-century life.

HE330 Contemporary American Literature: World War II to the Present (3–0–3). A study of American literature from 1945 to the present. Concentrates on responses of contemporary writers to the idiosyncratic problems and themes of the post-World War II era such as the nuclear age, computer technology, and television, the Vietnam experience, racial questions, the debasement of the language, and environmental issues.

HE333 Shakespeare and His Contemporaries (3–0–3). A study of Elizabethan and Jacobean ideas and attitudes through the investigation of a representative sample of Shakespeare's tragedies, histories, and comedies as well as a few plays by contemporaries of Shakespeare.

HE343 Creative Writing (3–0–3). After completing initial problem-solving exercises in prose, poetry, and drama, students embark upon an approved workload of their own design. Criticism of students' work is accomplished through classroom workshops and individual conferences with the instructor.

HE344 Professional Writing (3–0–3). Designed for students interested in advanced methods of preparing, writing, and presenting articles and reports. After initial study and analysis of the form and style in a wide variety of prose writing and practice in various prose forms, students will design and present independent projects.

HE360 Special Topics in Literature (3–0–3). An open-topics literature course. Topics vary from semester to semester and include such offerings as "Myth and Fantasy," "Literature of American Minorities," "Science Fiction," and "Images of Women in Literature."

400-Level Courses: General Description

The HE460 series allows students and English Department faculty members with special expertise to pursue together an intensive study of a restricted literary subject. Emphasis in each course will be upon extensive and intensive reading in a limited body of material, techniques of research, and the development of independent critical judgment. Prerequisites for these courses are at least one 300-level English course and permission of the instructor. Selection of students for HE470, Pedagogy in English, is made by the English Department from among 1/C English majors.

HE442 Introduction to Literary Criticism (3–0–3). The theory and practice of literary criticism. Concentrates on what critical approach can yield to the reader in the way of deeper understanding and satisfaction from the work of art. Offered each semester. Required of all English majors. *Prereq: 1/C standing, or permission of department chairman.*

HE461 Studies in a Literary Period (3–0–3). In-depth study of a limited period in literary history. For example: "Pope and His Literary Contemporaries," "The Beginnings of Romanticism," "The American Renaissance (1830–1860)," and "The 1920s in American Literature."

HE462 Studies in a Literary Problem (3–0–3). Cutting across traditional divisions of nationality, historical period, or genre, the materials of this course will be selected to focus on some timeless problem of literature and the human existence it reflects. For example: "Myth and Symbol in Literature," "Literature and Science," "The Concept of the Hero."

HE463 Studies in Literary Figures (3–0–3). Extensive reading in the works, biography, and criticism of major figures of world literature. For example: Milton, Wordsworth, Dickens, Joyce, D. H. Lawrence, Melville, Twain, Faulkner, Dostoevsky, Thomas Mann. No more than three such writers will be considered in any one semester.

HE467 Studies in a Literary Genre (3–0–3). Study in a special genre. For example: "The Epic," "The Autobiographical Novel," "Science Fiction," "Imagist Poetry."

HE470 Pedagogy in English (3–0–3). Experience in leadership and in techniques of education and training through teaching a section of a 4/C writing tutorial under supervision of a member of the staff of the Department of English. Limited to three 1/C English majors per semester.

"The best way to sum up what the Academy means to me is that if I had it all to do over again, I would—gladly."

Department of History

> "This place teaches you how hard you can push yourself and still do more. I think most people go through life and don't find that out."

History Major

The major in History concentrates upon the development of the important civilizations, societies, and states of the world. The knowledge of historical evolution that is acquired will contribute significant perspective and maturity to the understanding of the great crises and confrontations of today's world, and to a more acute awareness of the institutions and values at issue. The program provides a basic historical background as well as the opportunity for specialized study in the fields of American, European, non-Western, naval, and military history. An undesignated Bachelor of Science degree is awarded. An honors program with a designated "honors" degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NL303, NN302, EN300, ES300, EE311–312, ES400, NL300*, NL400;
Mathematics: SM201, SM202 or SM211, SM212;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, and three elective courses;
Language: Four semesters of a modern language;
Special: none;
Major: HH262, and nine history electives.

*Taken during second class summer

History Courses

HH105 The Western Cultural Heritage to 1815 (3–0–3). Analyzes patterns of human thought and action from ancient times to 1815. Adopting the premise that the cultural products of a people express the values and aspirations of its members, this course approaches the development of Western civilization to 1815 through a study of its ideas and institutions.

HH106 Civilization and the Atlantic Community Since 1776 (3–0–3). Pursues the study of human ideas and institutions from 1776 to the present—focusing primarily on the United States and Europe. As in HH105, the course seeks to expose patterns of human thought and behavior in a cultural context. *Prereq: HH105.*

HH204 American Naval Heritage (3–0–3). This course examines the antecedents, origins, and development of the United States Navy within the framework of America's growth as a continental and, eventually, global power. *Prereq: HH105, HH106.*

HH223 Ancient Empires (3–0–3). Surveys the foundations of Western civilization in the lands bordering on the Mediterranean. Begins with the Greek city states and continues to the fall of the Roman Empire.

HH224 Medieval Society: Princes, Priests and Peasants (3–0–3). Surveys the development of Western civilization from the fall of Rome through the Middle Ages, Renaissance, and Reformation to the Age of Absolutism. It traces the development of the medieval synthesis, the rise of secular culture, commercial capitalism, and national government.

HH225 Renaissance, Reformation & Revolution (3–0–3). Focuses on the emergence of Western civilization from the discoveries and rediscoveries of the Renaissance, the sweeping changes brought by the Reformation and Counter-Reformation, and the excitement of both scientific and political revolution. Offered in alternate years.

HP230 Introduction to Philosophy and Logic (3–0–3). A survey of Western secular philosophy based on readings in representative philosophers; the basic problems of philosophical inquiry and a variety of solutions to them; principles of logic.

HP232 Ethics (3–0–3). A critical examination of systems of values and standards, with a discussion of current moral issues.

HH241 Survey of American History (3–0–3). A survey of American history from discovery to the present, emphasizing the political, diplomatic, social, and economical developments that explain the nation's rise from settlement to superpower.

HH262 Perspectives on History (3–0–3). A methodology course in which History majors acquire the basic technical skills required for research and writing in subsequent courses in history and other humanities/social sciences disciplines. *Prereq: history major, 3/C.*

HH317 Radicals and Revolutionaries in Modern Europe (3–0–3). A study of those individuals and groups who challenged and, in some instances, transformed European society from the 17th to the 20th centuries. Emphasis is placed on both the origins and consequences of radicalism and revolution.

HH318 War and European Society Since 1870 (3–0–3). A study of the origins and consequences of war on European society. The societal response to both total and cold war is assessed. War is examined as a force promoting change, including responses ranging from fascism through European economic unity.

HH319 Diplomats and Statesmen in Modern Europe (3–0–3). A study of the major governmental figures of modern Europe who helped shape the diplomatic history of the modern world as seen through their contributions to the art of international political decision-making.

HH321 Muscovite and Imperial Russia (3–0–3). A study of Russian history from the founding of Moscow to 1917, examining the domestic and external forces responsible for the shaping the structure of Russian society and culture.

HH322 Revolutionary and Soviet Russia (3–0–3). An examination of the Revolution of 1917 and the development of the Soviet Union, emphasizing the institutions and policies adopted to meet domestic and foreign problems.

HH327 Germany and the Nazi Experience (3–0–3). Focuses on the antecedents of National Socialism, including the Second Reich and World War I eras, the Nazi experience itself, and the legacy it bequeathed to today's two existing German States.

HH328 Modern Britain and France (3–0–3). Treats the history of modern Britain and France, comparing the growth of political, social, and imperial institutions.

HP336 Philosophy of Religion (3–0–3). A philosophical analysis of the central concepts and problems of the Judeo-Christian tradition. The nature of religion, faith, God, evil, and immortality examined from Plato through the death-of-God theologians. *Prereq: 1/C or 2/C only, or permission of instructor.*

HP340 Philosophy of Science (3–0–3). An examination of the impact of science on 20th century society, the values assumed by science, and the nature of scientific discovery and experimentation. *Prereq: 1/C or 2/C, or permission of instructor.*

HH345 Colonial America (3–0–3). The origins of American civilization from the Age of Discovery to 1776. Emphasis is placed upon the founding of the colonies and their institutional development.

HH346 Revolutionary America and the Early Republic (3–0–3). Traces the revolutionary movement and the subsequent development of the new nation, emphasizing the coming of the revolution, the institutionalization of the revolutionary ideal, and the dual development of nationalism and sectionalism.

HH347 Civil War and the Emergence of Modern America (3–0–3). An examination of the political, economic, and social developments from the beginning of the Civil War to World War I, including the wounding of the nation in a civil war and the reunification that made the United States a great power.

HH348 Recent American History (3–0–3). An examination of the political, social, and economic developments from the Progressive era to the Cold War, including World War I, the Era of Normalcy, the New Deal, and World War II and its aftermath.

HH353 American Social History (3–0–3). An examination of American life and culture and the forces that have shaped them, emphasizing mass media, popular entertainment, religious movements, and technological advances.

HH354 American Diplomatic History (3–0–3). An examination of American foreign relations from the War for Independence through the Cold War. Particular attention is paid to the policies of presidents and secretaries of state, and to the combination of forces that affected their conduct of the nation's foreign relations.

HH357 History of Ethnic America (3–0–3). A survey of the experiences of various ethnic groups in the United States from colonial times to the present – their arrival and adaptation to America and opposition to them in the form of both nativism and racism. Offered in alternate years.

HH358 American Constitutional and Legal History (3–0–3). An examination of the American constitutional and legal systems from their pre-colonial background to the present. The course emphasizes the legal system as a product of American society during the particular era under consideration.

HH359 U.S. Sectional History: The West (3–0–3). Deals with the opening of the trans-Mississippi frontier. Topics

"Everyone gets into his own little depression thinking about what the guys are doing in other colleges back home. Then, while walking through the yard the next day, something seems to say, 'Hey, you're a lucky guy to be here' and everything seems to work out."

"There's a sign in one of our gyms that says, 'If you're killing time, you're murdering opportunity.' I guess that's what I've learned best here."

emphasized include land policy, railroads, Indian wars, and water policy. Offered in odd-numbered years.

HH360 U.S. Sectional History: The South (3–0–3). Tracks the development of distinctive regional subcultures within the American experience and focuses on unique regional contributions to the nation. Offered in even-numbered years.

HH361 Modern History of China and Japan (3–0–3). An analysis of contemporary Asian problems which considers their cultural and institutional origins, their 19th century development under the impact of Western influence, and their culmination in contemporary Asian nationalism.

HH362 History of the Middle East (3–0–3). A long-range historical approach to the Middle East's role in world affairs and the development of its cultural, political, and military institutions. Emphasis is placed on strategic and diplomatic considerations.

HH363 History of Latin America (3–0–3). The impact of Europe in the colonial period, the independence struggle, the rise of national states, and the interplay of world forces upon the shaping of 20th century Latin American life.

HH364 History of Africa (3–0–3). A survey of social, cultural, and political developments on the African continent from the era before European colonization to the present. Offered in alternate years.

HH365 History of South Asia (3–0–3). A survey of the history of modern India and her adjacent areas, such as Pakistan, Burma, and southeast Asia. Concentrates on developments in this locale from the 19th century to the present. Offered in alternate years.

HH373 War in the Western World: The Martial Heritage to 1648 (3–0–3). Examines the development of tactics, strategy, and military organizations from the Greek hoplite armies through the Thirty Years War. Places these developments in their social and economic context.

HH374 War in the Western World: The Rise of Modern Warfare, 1648–1945 (3–0–3). Examines the dimensions of warfare since the Thirty Years War and civil-military relations in a broad social context.

HH375 Recent Military and Naval History (3–0–3). Surveys recent military from 1945 to present. Conflicts dealt with include the Chinese Civil War, the Korean War, Vietnam, and the Battle of the Falklands.

HH377 Western Cultural History (3–0–3). An introduction to the major epochs of Western development in the fine arts, this survey examines the evolution of contemporary painting, sculpture, architecture, and music as well as the individuals and societies that produced them.

HH380 History of Science and Technology (3–0–3). A cross-cultural survey of the history of scientific discoveries and their practical applications, from the early natural philosophers to the present, with emphasis on the scientific revolution of the 17th century, the Industrial Revolution, and the information explosion of the 20th century.

HH382 Biography in History (3–0–3). Deals with historically significant men or women through the medium of biography. Typical sections might cover great naval leaders, women in antiquity, or 19th century engineers.

HH470 History of Military Thought (3–0–3). A study of warfare and military institutions through the views of the military leaders most influential in formulating and changing them, from ancient times to present. *Prereq: HH373, HH374, HH375, or permission of instructor.*

Division of U.S. and International Studies

Department of Language Studies
Department of Economics
Department of Political Science

Department of Language Studies

The Department offers courses at all levels in Chinese, French, German, Russian, and Spanish. Midshipmen majoring in Economics, English, History, or Political Science complete or validate a total of four semesters of a given language, and have the option of continuing with one or two advanced language courses. In other majors, midshipmen eligible for advanced language courses (200-400) may take them as humanities/social science electives. All midshipmen may take language courses at the 100 level as free electives.

"When you work closely in a pressure-filled environment, you make lasting friendships. I'm proud to have gone to school here."

French Courses

FF101 & FF102 Basic French I & II (3-0-3, 3-0-3). Emphasizes the spoken language.

FF201 & FF202 Intermediate French I & II (3-0-3, 3-0-3). Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FF102.*

FF301 & FF302 Advanced French with Civilization Readings I & II (3-0-3, 3-0-3). Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of French civilization. *Prereq: FF202.*

FF411 Development of French Civilization (3-0-3). From the origins of World War II. *Prereq: FF302 or approval of department chairman.*

FF412 Modern France (3-0-3). Contemporary French society, institutions, and national policies. *Prereq: FF302 or approval of department chairman.*

FF421 & FF422 Representative Readings in French Literature I & II (3-0-3, 3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FF302 or approval of department chairman.*

German Courses

FG101 & FG102 Basic German I & II (3-0-3, 3-0-3). Emphasizes the spoken language.

FG201 & FG202 Intermediate German I & II (3-0-3, 3-0-3). Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FG102.*

FG310 Introduction to Contemporary West Germany (3-0-3). An introduction to the geography and political, economic, and social systems of the Federal Republic of Germany, in German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG320 Introduction to German Literature (3-0-3). In German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG411 Development of German Civilization. (3-0-3). Contemporary German society, institutions, and national policies. *Prereq: FG310 or approval of department chairman.*

FG421 & FG422 Representative Readings in German Literature I & II 3-0-3, 3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FG320 or approval of department chairman.*

Chinese Courses

FC101 & FC102 Basic Chinese I & II (3-0-3), 3-0-3). Emphasizes the spoken language. Provides introduction to writing sytem.

FC201 & FC202 Intermediate Chinese I & II (3-0-3, 3-0-3). Continues development of oral skills. Includes exercises in character recognition and reading of graded cultural texts. *Prereq: FC102.*

FC301 & FC302 Advanced Chinese I & II (3-0-3, 3-0-3). Further development of audio-linqual skills and competence in reading. Emphasis on Chinese cultural patterns. *Prereq: FC202.*

FC401 & FC402 Reading and Discussion in Modern Chinese I & II (3-0-3, 3-0-3). Selected texts on major aspects of Chinese areas, civilization, and culture. *Prereq: FC302.*

Spanish Courses

FS101 & FS102 Basic Spanish I & II (3-0-3, 3-0-3). Emphasizes the spoken language.

FS201 and FS202 Intermediate Spanish I & II (3-0-3, 3-0-3). Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FS102.*

FS301 Advanced Spanish with Civilization Readings (3-0-3). Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of Hispanic civilization. *Prereq. FS202.*

FS304 Advanced Conversational Spanish (3-0-3). Develops fluency through discussions based largely on literary selections and articles on life in Hispanic countries. Program includes naval dialogues and terminology. *Prereq. FS202.*

FS412 Contemporary Latin American Civilization (3-0-3). Current social, economic, cultural, and political patterns and problems. *Prereq: FS304 or approval of department chairman.*

> *"Civilizations which have developed very diverse traditions and diverse ways of life during the centuries for which they have been living in isolation have now suddenly been brought within point-blank range of one another. Their atomic missiles are now poised head to head, while their minds and hearts are still poles apart."*
>
> ARNOLD J. TOYNBEE

FS413 Spanish Civilization (3–0–3). Cultural history, contempoary institutions and society. *Prereq: FS304 or approval of department chairman.*

FS421 Spanish Literature (3–0–3). Representative works such as the *Cid* and *Don Quixote* reflecting the culture and civilization of Spain and its major literary periods. *Prereq: FS304 or approval of department chairman.*

FS422 Spanish American Literature (3–0–3). Novels, stories, essays, poetry, and plays reflecting the characteristics and civilizations of major Spanish American countries from Modernism to the present. *Prereq: FS304 or approval of department chairman.*

Russian Courses

FR101 & FR102 Basic Russian I & II (3–0–3, 3–0–3). Emphasizes the spoken language.

FR201 & FR202 Intermediate Russian I & II (3–0–3, 3–0–3). Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FR102.*

FR330 Writings from Twentieth Century Russia (3–0–3). Emphasizes spoken Russian. Discussions on Russian civilization and culture. *Prereq: FR202.*

FR340 Writings from Post-Stalin Russia (3–0–3). Continues emphasis on spoken Russian. Discussions of Soviet civilization and culture, including naval and military topics. *Prereq: FR202.*

FR411 Development of Russian Civilization (3–0–3). From the 10th century to World War II. *Prereq: FR340 or approval of department chairman.*

FR412 Modern Russia (3–0–3). The Soviet Union since World War II; social, cultural, economic patterns; technology, armed forces; national policies. *Prereq: FR340 or approval of department chairman.*

English Course

FX101 & FX102 English for Non-Native Speakers I & II (3–0–3, 3–0–3). Alternative to common plebe year courses HE111 & HE112. *Prereq: approval of department chairman.*

Department of Economics

Economics Major

The major in Economics is designed to acquaint prospective naval officers with both macro- and micro-economic theory, quantitative methods in economics, economic problem-solving in an institutional context, and international economic relations of the United States. An undesignated Bachelor of Science degree is awarded. An honors program with a designated "honors" degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NL303, NN302, EN300, EE311-312, ES400, NL300*, NL400;
Mathematics: SM201, SM202 or SM211, SM212;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, and three elective courses;
Language: Four semesters of a modern language;
Special: none;
Major: FE210, FP210 or FP230 or FP438, FE312, FE331, FE341, FE486, and five elective courses in economics with at least two at the 400-level.
Restricted elective: one.

*Taken during second class summer

"Now when I go back, it's unbelievable the amount of interest in the Academy— people are kind of kicking themselves they didn't take the opportunity I did."

Economics Courses

FE210 Basic Economics (3-0-3). An introductory course in elementary economic theory and its application to contemporary problems. Topics include income determination, monetary policy and institutions, public finance, price theory, and international trade.

FE220 Accounting (3-0-3). An introductory course in the basic principles of accounting. *Cannot* be taken for HUM/SS credit.

FE301 Financial Analysis (3-0-3). A study of the theory and techniques of financial analysis applied in the federal government and industry. *Prereq: FE220.*

FE310 Economic Geography (3-0-3). Provides a systematic understanding of economic growth and the issue of finite limits to improved living standards around the world. Studies population growth, the resources of the principal nations of the world, industry location, international trade, commodity cartels, and the requirements for continued technological advance.

FE311 History of Economic Thought (3-0-3). Traces the evolution of economic doctrine from the ancients to modern day with emphasis on the period since the 18th century. Reviews the contributions to economic knowledge by Smith, Malthus, Ricardo, Marx, Mill, Marshall, Keynes, and others. Various schools of thought, including mercantilism, classical, neo-classical, historical, institutionalism, and Keynesianism are examined. *Prereq: FE210.*

FE312 Macroeconomics (3-0-3). The significance and determinants of the aggregate levels of income and employment, the price level, consumption, interest rates, investment, alternative monetary and fiscal policies. *Prereq: FE210*

FE321 Comparative Economic Systems (3-0-3). An introduction to the study of alternate forms of economic organization, with emphasis on comparing the ideological basis, structure, and performance of capitalist, socialist, and mixed economic systems. *Prereq: FE210.*

FE331 Economic Statistics (2-2-3). Survey of descriptive and inferential statistical techniques involving more than one variable. Strong emphasis on regression analysis and use of computers. *Prereq. FE210.*

FE341 Microeconomics (3-0-3). Theories of the economic behavior of consumers and producers, the determination of final good and factor prices, market structures, and general economic equilibrium. The application of price theory to business problems and public-policy issues. *Prereq: FE210.*

FE345 Environmental Economics (3-0-3). Economic evaluation or policies involving conflicting public and private uses of natural resources. Topics include environmental benefit and cost measurement, causes and consequences of pollution, management of depletable and renewable resources, and the economics of energy. Not offered every year. *Prereq: FE210.*

FE351 Public Policies Toward Business (3-0-3). An examination of public regulation of private enterprise in the U.S. with emphasis on the rationale for and application of antitrust policy and direct regulation. *Prereq: FE210.*

FE354 Development of the U.S. Economy (3-0-3). Economic theory is used to analyze the evolution of the U.S. economy; among topics considered are the American Revolution, westward expansion, slavery, industrialization, market concentration, and the Great Depression. *Prereq: FE210.*

FE361 Urban Economics (3-0-3). Study of economic growth and structure and economic problems of cities, with attention to poverty, transportation, housing, and racial discrimination. Not offered every year. *Prereq: FE210.*

FE362 The Economics of Technology (3-0-3). An analysis of productivity growth, characteristics of invention and innovation, determinants of research, and development activities of government and business; the economic impact of automation, and reindustrialization. *Prereq: FE210.*

FE401 Quantitative Economic Techniques (3-0-3). Quantitative approach to theoretical and applied economic problems. Methods taught include order quantity models, linear programming, network models, microeconomic resource allocations, macroeconomic models, life cycle cost problems, and cost-benefit analysis. *Prereq: FE210.*

"I wish I could persuade you to try to overcome the difficulties instead of merely intrenching yourself behind them."

WINSTON CHURCHILL

FE411 Economics of Developing Nations (3–0–3). Study of the economic characteristics, problems, and policies of developing nations, covering economic growth patterns in Third World nations, their changing role in the international economic order, and the different economic routes being employed toward economic progress. *Prereq: FE210.*

FE412 International Trade and Finance (3–0–3). Study of international economic relations, especially trade and protectionism, multinational enterprise, the world monetary system, and regional integration. Primary emphasis on relations between the developed nations of North America, Europe, and the Pacific Basin. Case studies of current issues cover OPEC, commodity cartels, and relations with socialist nations. *Prereq: FE210.*

FE421 Economics of National Defense (3–0–3). The application of economic analysis to Defense decision-making, and the consequences of Defense decisions for the U.S. economy. Topics include hi-tech vs. low cost weapons; volunteers vs. conscription; leaders vs. resource managers; Soviet vs. U.S. spending; competitive vs. monopoly contractors; pay vs. non-pay factors in reenlistment. *Prereq: FE210.*

FE422 Economics of Labor Relations (3–0–3). A study of the distribution of income with emphasis on the demand for and supply of labor services; the choice-theoretic behavior of firms and individuals in the determination of wages and the employment level. Topics analyzed include human capital theory, occupational choice, the unemployment-inflation relationship, and the wage effects of discrimination and unions. Union history, labor laws, and institutions are discussed. *Prereq: FE210.*

FE431 Public Finance (3–0–3). The use, in a market economy, of government expenditures and taxation to change the allocation of resources and to modify the distribution of income. Examination of the economic effect of government budgetary policy. Microeconomic theory and Federal tax and budgetary institutions are emphasized. *Prereq: FE210.*

FE434 Money and Banking (3–0–3). A consideration of central and commercial banking institutions; an investigation of the demand for money and its role as a focal point for monetary policies designed to obtain full employment, price stability, and international monetary equilibrium. *Prereq: FE210.*

FE445 Econometrics (3–0–3). Quantification of basic economic theory; multiple regression, correlation, and identification techniques for the construction and testing of economic models, and a study of selected alternative models of particular economic interest. Not offered every year. *Prereq: FE210 and Calculus I & II.*

FE472 Cost Accounting (3–0–3). A study of concepts and techniques of cost accounting. Primarily concerned with the derivation of produce cost arising from materials, labor, services employed, and overhead. *Cannot* be taken for HUM/SS credit. *Prereq: FE220, FE301.*

Department of Political Science

Political Science Major

"I organize my time well. I have my goals and I just work at them."

The major in Political Science is designed to acquaint prospective naval officers with the elements of political analysis. It provides an understanding of the structure and functions of international politics and of various political systems, and analyzes related problems and issues. The wide range of courses allows midshipmen to select an area of concentration within the discipline, such as American or international politics, comparative and international politics of regions, and political theory. The program includes a requirement for four semesters of a modern language, with an opportunity to take additional language, economics, and history courses. An undesignated Bachelor of Science degree is awarded. An honors program with a designated "honors" degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)
Professional: NN203, EN200, NS252, NS300*, NL303, NN302, EN300, ES300, EE311-312, ES400, NL300*, NL400;
Mathematics: SM201, SM202 or SM211, SM212;
Science: SP211, SP212;
Humanities/Social Sciences: HE300*, HH204, and three elective courses;
Language: Four semesters of a modern language;
Major: FP210, FP220, FP230, FE210, and six approved political science courses plus one approved history or economics course.

*Taken during second class summer

Political Science Courses

FP210 Introduction to International Relations (3–0–3). Introduction to the various approaches to international relations; the nature of the international political system; foreign policy analysis; the principles, theories, machineries, and major problems of international relations.

FP220 Political Science Methods (3–0–3). A discussion of the philosophy of science for the political scientist; instruction in research methods with emhasis on quantitative techniques.

FP230 United States Government and Constitutional Development (3–0–3). Areas of study include the basic concepts of American democracy, the Constitution and its development, the political process, and the structure and functions of the national government and the factors which influence is operation.

FP311 Public Policy and Administration (3–0–3). An analysis of the formulation and administration of public policy in the United States. Examines political issues and policy alternatives relating to budget, defense, health care, energy, education, regulatory, and other governmental problems.

FP312 Communism: Theory and Practice (3–0–3). The philosophy of Communism, the Comintern, relations of the Soviet Union with radical parties outside Russia and with European Social Democratic Parties.

FP313 Science, Technology and International Relations (3–0–3). The effects of science and technology on both the national and international political systems. The role of the scientist; development, and research in national and world decision-making. Special emphasis is given to nuclear non-proliferation, space cooperation, and environmental control.

FP314 Formulation of U.S. Foreign Policy (3–0–3). The formulation and execution of the various American foreign policies to include: constitutional roles, the decision-making structure, military input to policy-making, the administration of foreign policy; agencies, procedures, and practices. Substantive policy is analyzed in light of decision-theory, ends-means, and capability analysis.

FP322 Comparative European Politics (3–0–3). Using a contemporary and comparative approach, this course focuses on the structures and functions of the political systems of some of the principal European nations.

FP323 Comparative Latin American Politics (3–0–3). An analytical treatment of the structure and dynamics of independent Latin American political systems, individually and in comparison; parties, interest groups, the military, the church, revolution, foreign policy, and political thought.

FP324 Latin American International Politics (3–0–3). The Inter-American System; patterns of Inter-Latin American and extrahemispheric relations; the Latin American policy of the United States.

FP325 American Political Theory (3–0–3). A detailed analysis of the currents of American political theory from the 18th century to the present. Traditional concepts are critically analyzed in world perspective.

FP326 The American Presidency (3–0–3). The growth and evolution of the Office of the President; executive agencies, their function, control, and problems. Special attention is given to the President's role as Commander-in-Chief, and his relations with the legislative and judicial branches. *Prereq: FP230 or consent of instructor.*

FP328 The Legislative Process (3–0–3). A comparative examination of the legislative process at all levels of American government with special emphasis on congressional-military relations. *Prereq: FP230 or consent of instructor.*

FP341 Political Behavior (3–0–3). An analytical treatment of political behavior from psychological, sociological, and cultural perspectives. Focuses on the formation of attitudes through socialization and personality development.

FP355 Civil-Military Relations (3–0–3). An interdisciplinary approach to the complex nature of civil-military affairs.

FP357 Chinese Politics (3–0–3). An examination of Chinese political and military systems from 1927 to the present. Emphasis is placed on economic, political, and foreign policies of the Chinese Communist regime.

FP365 African Politics (3–0–3). An introduction to the political trends and constitutional developments of present day African governments; their relations with one another and the rest of the world. Attention is directed to the U.S. security aspects of African national growth.

FP367 Soviet Politics (3–0–3). The development of the Soviet system of government. Leninism and Stalinism, structure and functions of the central government, Council of Ministers, the Supreme Soviet, Presidium, Central Committee, and Defense Ministry.

FP368 Comparative Asian Politics (3–0–). A systematic comparative approach to the study of Asian governments, their political, economic and military development, regional relationships, and problems.

FP369 Middle Eastern Politics (3–0–3). A comparative analysis of politics and institutions, including foreign policy of Middle Eastern nations. The conflict of nations within this system and the world-wide effects are emphasized.

FP370 Soviet Foreign Policy (3–0–3). Analysis of the geopolitical, ideological, institutional, cultural, and economic factors affecting the formulation and conduct of Soviet foreign policy in relation to the United States, Europe, China, and the Third World.

FP371 Asian International Politics (3–0–3). An examination of the Asian nations' political relationships with each other and the rest of the world, with special emphasis on U.S.-Asian relations.

FP372 Political Parties and Pressure Groups (3–0–3). A study of the dynamics of group politics in the American system of government. Emphasizes the roles played by parties, interest groups, public opinion, and elections in the American political process. *Prereq: FP230 or consent of instructor.*

FP394 Political Theory (3–0–3). A study of political philosophy, with emphasis on the roots of democracy; the writings of the major writers from Plato to the present.

FP397 Criminal Law and Justice (3–0–3). The nature of the criminal justice system and criminal law are analyzed with emphasis on leading Supreme Court decisions and the system's key actors and institutions—police, the accused, defense and prosecution attornies, judges and juries, incarceration and parole.

FP407 Intelligence and National Security (3–0–3). Examines the nature, significance, and development of intelligence including collection, counterintelligence, clandestine and covert action, and evaluation. Contemporary issues facing the intelligence community and case studies are included. *Prereq: 2nd class standing and U.S. citizenship.*

FP408 International Law (3–0–3). A survey of the public law of nations, including the law of peace, the law of war, and law of the sea. Problems and case studies are used extensively.

FP411 Constitutional Law (3–0–3). A survey of the basic principles of the Constitution, particularly the civil and political rights of the individual, as determined by the Supreme Court. *Prereq: FP230 or consent of instructor.*

FP421 National Security Policy (3–0–3). Stresses the interaction of domestic, foreign, and military considerations in the making and execution of national security policy. Case studies and national strategic estimates highlight the course.

FP437 International Organizations (3–0–3). A study of the expanding role of international organizations (particularly in the security field) since the end of World War II. Special attention is given to the U.S. to major regional systems, and to the U.S. role in multilateral diplomacy.

FP438 Comparative Government and Politics of Developing Areas (3–0–3). Governmental and political problems, institutions, and behavior in developing areas. Political thought, impact of change, leadership, and organization in Africa, Asia, and Latin America.

Division of Professional Development

Department of Leadership and Law
Department of Seamanship and Navigation

Department of Leadership and Law

Leadership and Law Courses

All midshipmen, regardless of major, must complete the following courses:

NL102 Leadership I: Fundamentals of Naval Leadership (2-0-2). An introductory course to instill in midshipmen a professional sense of purpose and personal honor. Military leadership traits and techniques which involve the communication of ideas and the action of command are explored.

NL200 Leadership II: Human Behavior (3-0-3). This is a basic introduction to general psychology. The course presents the theories and principles of individual and group behavior, and their relationships to effective leadership in the naval service. *Prereq: NL102.*

NL300 The Law of Armed Conflict (1-0-1). This course acquaints midshipmen with the historical development, sources and purposes of the law of armed conflict; and develops an understanding of humanitarian principles embodied in the law, the rules governing the conduct of hostilities, and the rights, obligations and responsibilities of naval personnel under international and domestic laws during time of conflict.

NL303 Leadership III: Application (3-0-3). A culminating course to reinforce the practical aspects of leadership in the naval service, utilizing the case-study process to aid midshipmen in formulating their own style of leadership. *Prereq: NL102.*

NL400 Law for the Junior Officer (2-0-2). A survey of the major aspects of military justice and administrative law relevant to the junior naval officer. *Prereq: 1/C standing.*

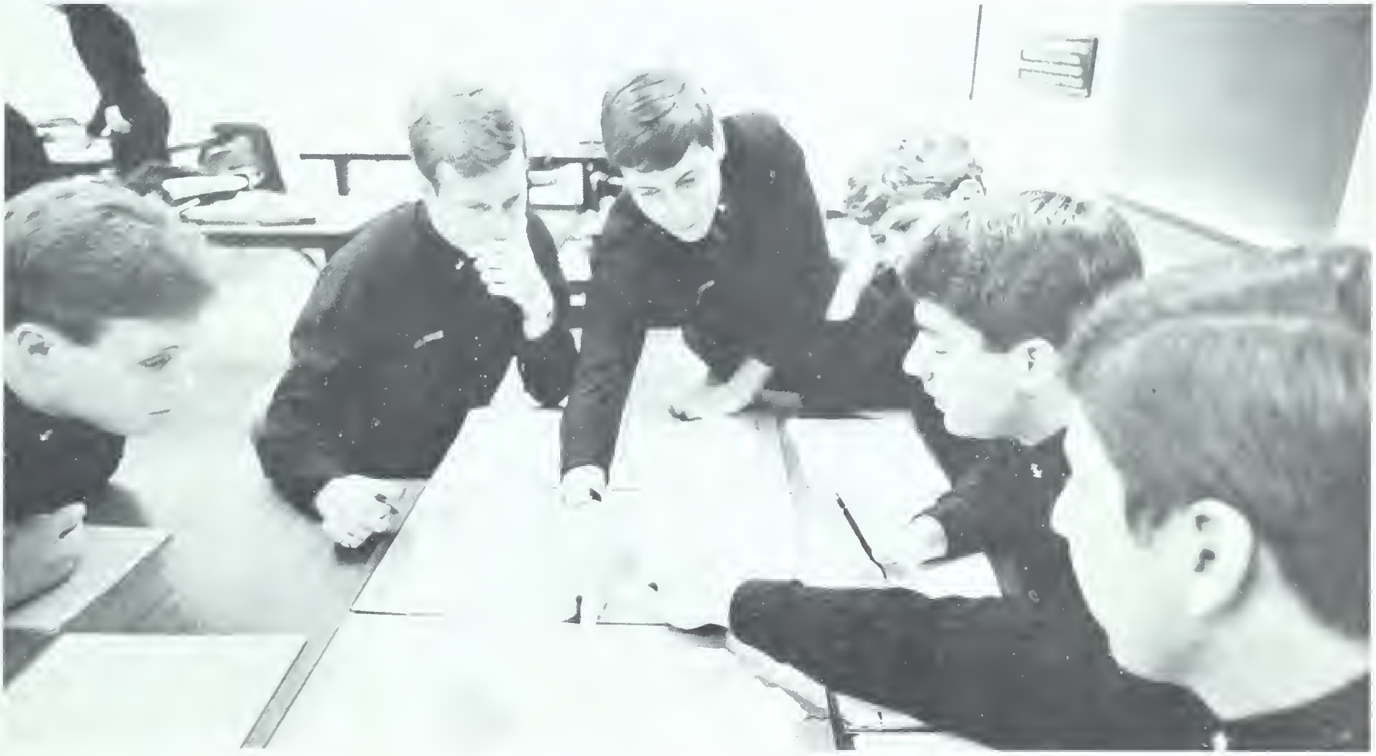
The following courses are offered as an elective:

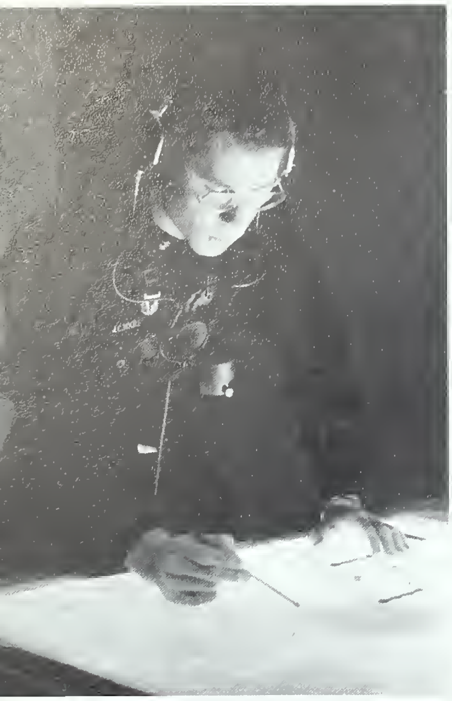
NL211 Social Psychology (3-0-3). Examines individual and group behavior with special focus on such phenomena as terrorism, propaganda, "brain wash", group dynamics, and formal/informal power. *Prereq: NL200*

NL306 Personality Theory (3-0-3). Exploration of major personality theory to provide an understanding of individual unique behavior, especially while under stress and in position of leadership. Each midshipman will examine his/her own personality variables, and construct a theory of personality. *Prereq: NL200 or validation of same.*

NL486 Leadership Practicum (3-0-3). A problem-solving seminar based on the theoretical constructs of previous leadership and management education. *Prereq: 1/C standing and permission of instructor.*

"Career? I'll have to wait and see what it's like in the Navy."





"The Academy has taught me that this country is great, especially when you travel to other countries and see how they live."

Department of Seamanship and Navigation

Seamanship and Navigation Courses

All midshipmen, regardless of major, must complete the following courses:

NS101 Fundamentals of Naval Science (2–2–3). Introduction to the basic concepts of seamanship and shiphandling, including laboratories on YPs, MSLs, an outdoor damage control trainer, and an indoor seamanship trainer. Instruction includes operational and administrative organization, communications, damage control, and basic weapons systems and rules of the road.

NN203 Navigation I (2–2–3). Terrestrial navigation, including piloting and navigation systems for surface navigation, basic meteorology. Labs include practical exercises and YP drills afloat. *Prereq: NS101.*

NN252 Shiphandling and Tactics (1–2–2). A course of professional instruction covering the art and science of shiphandling, ship control, multi-ship operations, basic warfare strategies, tactics, special seamanship, and operational evolutions emphasizing the development of midshipmen as capable mariners. *Prereq: NS101, 3/C cruise.*

NS300* Operations and Tactics (1–2–2). Develops the midshipman's proficiency in advanced shiphandling, tactics, and piloting during extended underway periods. Midshipmen form the nucleus of a ship's organization aboard a YP and function in leadership and administrative roles similar to those aboard fleet units. *Prereq: NS101, NN203, NS252.*

NN302 Navigation II (2–2–3). Celestial and electronic navigation, with instruction in star identification, theory and plotting; practical exercises; labs and lectures in the USNA planetarium. *Prereq: NN203.*

The following course is offered as an elective:

NN412 Air Navigation Systems and Air Traffic Control (3–0–3). An advanced study and application of air navigation, including electronic, celestial, and airways navigation methods and procedures. *Prereq: NN302.*

Academy-Wide Seminars, Research Projects and Interdisciplinary Courses

"*The Navy of the United States is the right arm of the United States and is emphatically the peace-maker.*"

THEODORE ROOSEVELT

Academic departments may offer seminars and individual research projects to upper classmen on the following basis:

Seminars:

XX 481 and *XX 482*	1–0–1
XX 485 and *XX 486*	3–0–3 Advanced topics

Research Projects:

A creative project in the student's field of interest. A faculty advisor must approve and monitor each project.

Prerequisite: approval of department chairman.

XX 491 and *XX 492*	0–2–1
XX 493 and *XX 494*	0–4–2
XX 495 and *XX 496*	0–6–3

Note: *XX* represents the departmental designator.

Interdisciplinary Courses:

Subject areas which do not fall within any single discipline or academic department. Courses are administered by the Interdisciplinary Course Committee.

ID483 and ID484	2–0–2
ID485 and ID486	3–0–3

CHAPTER 8

Professional Training

The Naval Academy gives midshipmen a broad academic and professional foundation upon which to build competence in any of the warfare specialties they may elect to pursue after graduation: surface warfare, aviation, the submarine service, or the Marine Corps. The development of a strong sense of commitment to the naval service and the fostering of high personal standards are major aims of the Academy's program.

Professional development of midshipmen starts on the very first day of plebe summer and continues through graduation four years later. It includes professionally oriented classroom studies (in all, 15 courses during the four years), drills and practical training conducted at the Academy during the academic year, and professional training conducted during the summer at shore bases and at sea in units of the Fleet. Among the subjects covered are instruction and training in navigation, seamanship and tactics, naval engineering, naval weapons, leadership, and military law.

Professional development is monitored and graded throughout the years at Annapolis. These grades are considered along with grades earned in other areas of the curriculum to determine class standing at graduation.

Fourth Class Summer

Introduction to Seamanship. Practical instruction in elementary seamanship, sailing sloops and yawls, powerboat handling, rules of the nautical road, visual signalling, and basic damage control.

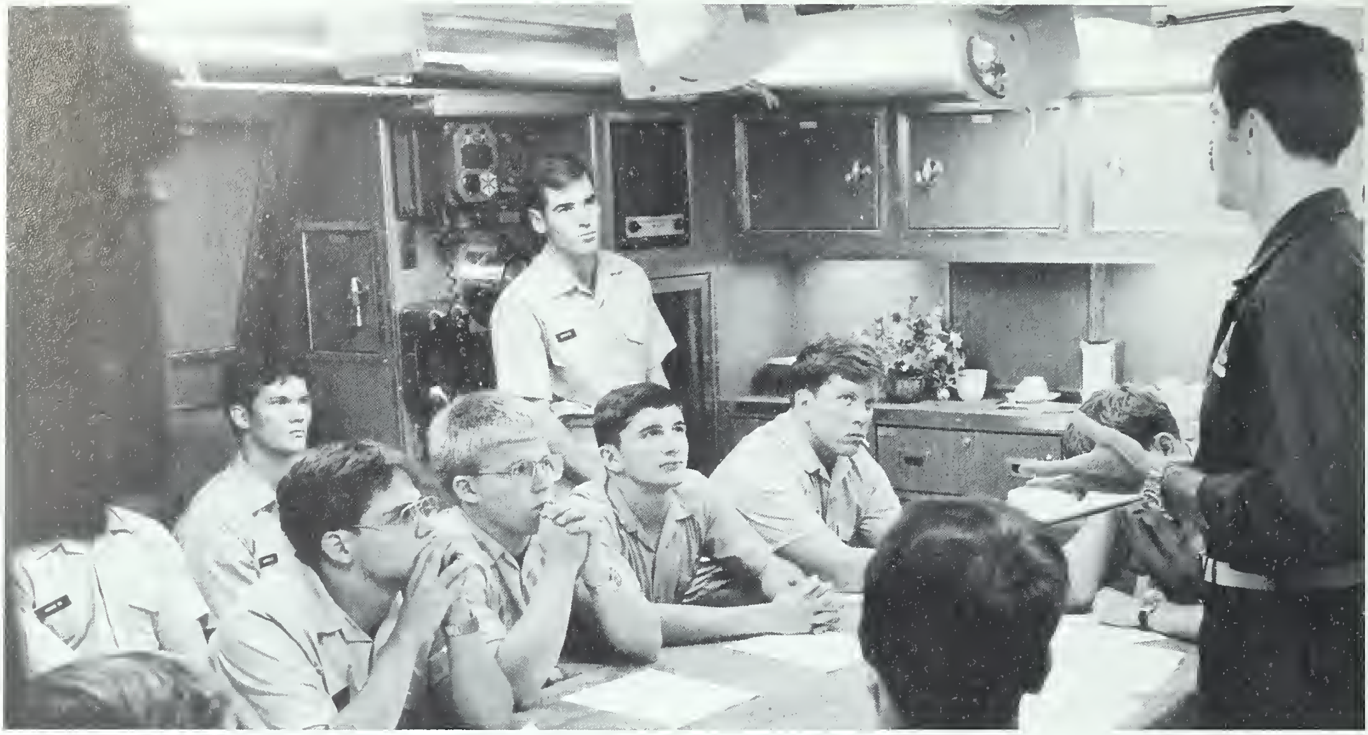
Physical Education Orientation and Indoctrination. Preliminary examinations in swimming and athletic ability. Classes in fundamentals of swimming, boxing, wrestling, fencing, hand-to-hand skills, and personal conditioning. Indoctrination drills in lacrosse, fencing, soccer, gymnastics, crew, golf, tennis, squash, and track.

Small Arms. Practical instruction in nomenclature, field stripping, and assembly of small arms. Firing of M14 rifle and service pistol. Midshipmen who qualify are awarded the Navy Expert Rifle and Pistol Medals.

Indoctrination. The plebe summer indoctrination program teaches the fundamentals of the Naval Academy and the Navy, as well as plebe responsibilities. The program helps midshipmen make a smooth transition from civilian life. The strenuous and demanding regimen prepares the plebes for rigors of the four-year program, and provides the basis for future development of professional competence, integrity, and physical and mental stamina.

Fundamentals of Naval Hygiene. The fundamentals of personal hygiene, including mental and physical hygiene and first aid.

Basic Cardiac Life Support. Instruction leading to American Heart Association qualification as a certified user of cardiopulmonary resuscitation.



"I haven't had any trouble with the professional courses. I guess it's because I feel they are the most important of all the courses that we have here."

Fourth Class Year

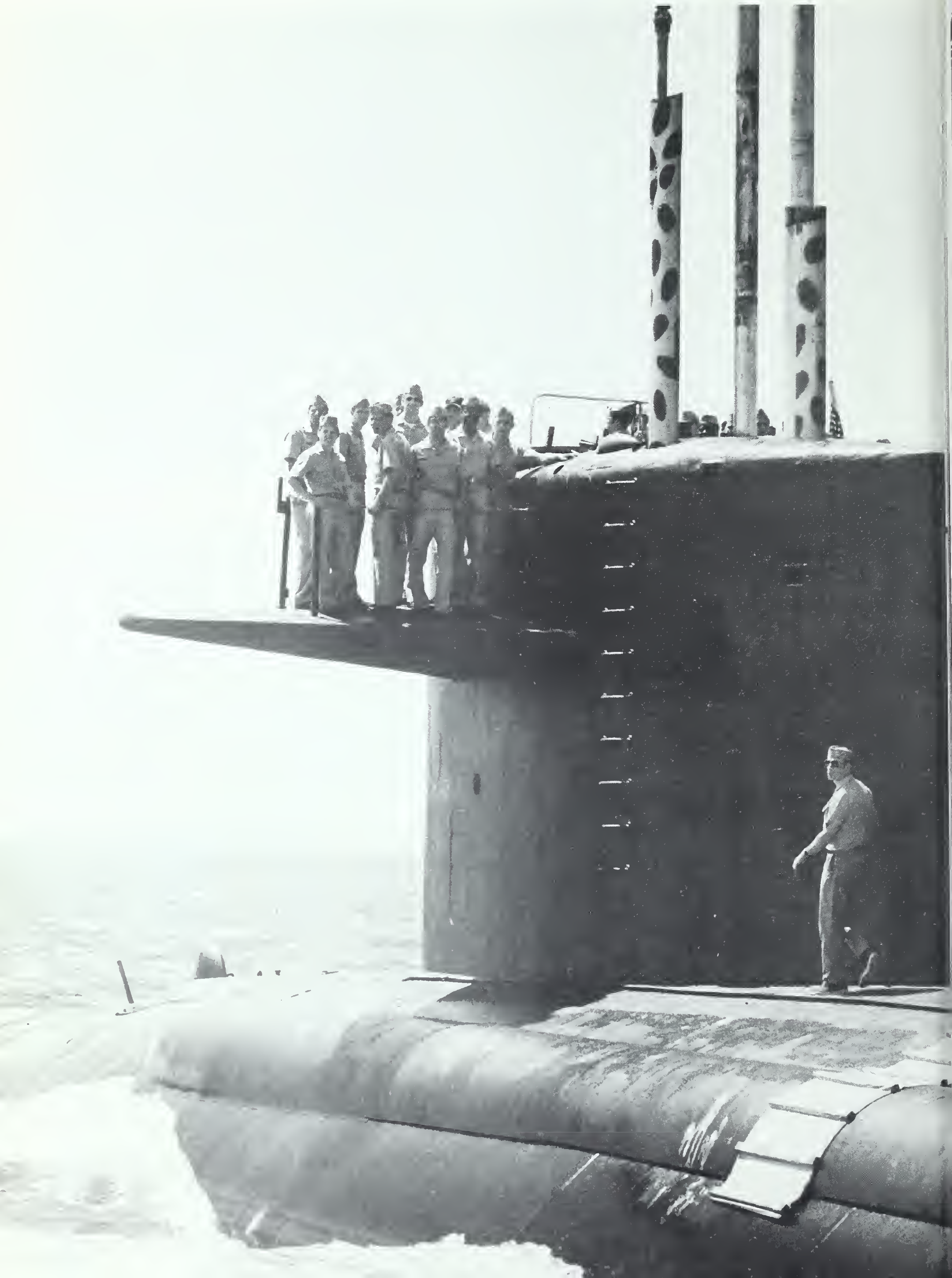
PE101 & 102 Physical Education. Instruction in the fundamentals of swimming, boxing, wrestling, gymnastics, hand-to-hand skills, soccer, golf, tennis, volleyball, basketball, squash racquets, and personal conditioning. Tests in applied strength, mile run, swimming, boxing, wrestling, gymnastics, and on the obstacle course. (Women midshipmen participate in fencing and hand-to-hand skills in place of boxing and wrestling.)

Infantry Drill. Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

Professional Courses. Three introductory professional academic courses in the fields of naval engineering, leadership, and naval science are taken during plebe year. These courses lay the groundwork for more advanced professional studies at the Academy. Engineering topics include the basic operation, function, and components of propulsion systems and auxiliary engineering equipment. Basic shiphandling, watch and battle organization, communications, and command and control centers are topics presented in the first of three naval science courses. The initial leadership course is designed to strengthen midshipmen's sense of responsibility, accountability, and personal integrity, as well as to thoroughly acquaint them with the professional environment in which they will be serving.

Third Class Summer

At-Sea Training. Midshipmen are sent to units of the Fleet on both coasts of the United States, as well as to the Sixth Fleet in the Mediterranean and the Seventh Fleet in the Pacific, for summer-at-sea training. Some midshipmen cruise on the Naval Academy's yard patrol craft (YPs) to various ports and training facilities along the Atlantic seaboard. Third classmen are introduced to Navy life at sea, to shipboard organization and relationships. They develop an appreciation of the tasks, responsibilities, and living and working conditions of enlisted personnel on board ship. Midshipmen actively participate in a wide range of shipboard tasks and evolutions under normal and simulated emergency conditions, both at sea and in port. They stand deck and engineering watches, participate in gun and missile evolutions, and become familiar with shipboard equipment. They are required to complete a cruise training journal. A number of midshipmen also participate in sail training programs for cruise credit, visiting ports along the Atlantic seaboard plus Bermuda and Nassau. The sail training cruises are offered to a limited number of midshipmen and provide superb leadership, navigation, and seamanship training.



"If you come here, you're guaranteed a profession and a job when you graduate. That's a big selling point for the Academy."

"I wouldn't say anything is easy here. You have to work for everything."

Third Class Year

PE201 & 202 Physical Education. Continuation of instruction in tennis, swimming, boxing, and wrestling. Instruction in the basics of judo. Tests in applied strength, mile run, swimming, boxing, and on the obstacle course. (Women midshipmen participate in judo and fencing in place of boxing.)

Infantry Drill. Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

Professional Courses. Four professional academic courses are taken during "youngster year." The first of two navigation courses, Navigation I, presents an introduction to the art and science of terrestrial navigation. Topics include chart reading, piloting (position plotting), and principles of basic weather phenomena. A naval engineering course offers studies in ship construction and system acquisition, material strength, and ship stability. The second of three leadership courses emphasizes psychology and considers the application of human behavior theory to effective military leadership. The second naval science course provides instruction in the art and science of shiphandling, radar piloting, and tactics.

Second Class Summer

Aviation, Submarine, Surface Line, and Marine Corps Orientation. Broad professional training in aviation, submarines, surface line, and the Marine Corps is conducted at bases away from the Naval Academy. In addition, during second class summer, midshipmen complete four weeks of professional and academic training at the Naval Academy, including afloat operations and tactics on yard patrol craft (YPs); an introduction to naval tactical warface using computer war games to evaluate the Soviet naval threat and U.S. countertactics; law of armed conflict; and public speaking.

Second Class Year

PE301 & 302 Physical Education. Advanced instruction in racquetball, swimming, the principles of personal conditioning, officiating, and the principles of hand-to-hand combat. Tests in applied strength, swimming, mile run, and the obstacle course.

Infantry Drill. Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

Professional Courses. The majority of a midshipman's professional academic courses, six courses in all, are taken during second class year. Navigation II continues the first navigation course with emphasis on celestial plotting, including celestial motion, development of various coordinate systems, solution of the navigation triangle, rules of the nautical road, and electronic navigation. Naval Weapons Systems includes sensor, tracking, computational, fire control, and delivery systems. Naval Engineering II concentrates on the principles of operation of fossil-fueled steam propulsion and gas turbine plants, as well as the basic elements of thermodynamics. Courses in naval electricity and in electronics are also taken. The last of three leadership courses taken at the Academy is designed to enhance midshipmen knowledge and understanding of responsibility, accountability, and authority; management techniques; problem-solving applications for organizations; and the processes of decision-making.

"You grow up a little faster. You have to mature to be able to handle the environment here. It's good for you."

First Class Summer

At-Sea Training. During their last summer of at-sea training with the Fleet, first class midshipmen actively participate in the duties and responsibilities of a junior officer at sea. They complete extensive practical work in navigation, taking celestial sightings and determining the ship's position. They are required to complete a cruise training journal, summarizing watches and work in engineering, seamanship, navigation, weapons, operations, and in basic fleet tactics. Selected first class midshipmen may participate in a Marine Corps cruise with the First Marine Brigade in Hawaii or the First Marine Division at Camp Pendleton, California. Here midshipmen learn first-hand what it is like to be a Marine officer, working with Marines of all ranks in Marine ground units and aviation squadrons. As with third class summer, a limited number of first class midshipmen may cruise on sail training or yard patrol craft for cruise credit. Selected first class midshipmen may also be assigned to air wings embarked in operating aircraft carriers.

First Class Year

PE401 & 402 Physical Education. Instruction in advanced swimming and personal conditioning. Tests in applied strength, mile run, swimming, and on the obstacle course. Electives in squash racquets, tennis, golf, volleyball, bowling, team sports, aerobics, and physical fitness.

Infantry Drill. Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

Professional Courses. The final two of the 15 professional academic courses are taken during first class year. The second weapons course teaches midshipmen the principles employed in weapons systems design, and exposes them to the complexities of modern-day weapons system integration. A law course, designed for junior officers, addresses procedural and substantive military law as well as personal responsibilities.

Professional Competency Review (PCR).

The PCR consists of a series of comprehensive examinations administered to midshipmen of each class during the spring semester. The PCR measures whether midshipmen are making satisfactory progress toward achieving the level of professional competence required for graduation and commissioning. It provides an opportunity for midshipmen to evaluate annually their own professional strengths and weaknesses. The PCR also provides meaningful feedback on the effectiveness of the professional curriculum (seamanship, navigation, engineering, leadership, weapons, and summer programs) and thus serves as an internal measure of how well the Naval Academy is achieving its goals.

CHAPTER 9

Varsity and Intramural Athletics

Just as the Naval Academy maintains a responsibility for the professional and intellectual development of midshipmen, so also must it fulfill its responsibility for the physical development of midshipmen. This is met through the intercollegiate sports program — with 23 men's and 10 women's varsity teams, one of the broadest in the nation — and an equally ambitious intramural program. All midshipmen are required to participate in these programs, either at the varsity or intramural level.

Vice Admiral William P. Lawrence, former Superintendent of the Naval Academy, and ex-POW in Vietnam noted: "I think there is one characteristic of the American people that contributes immensely to the greatness of our country and that's our dedication to excellence in every way of American life. And I think we attach a high degree of significance to excellence in physical fitness. Intercollegiate sports more or less represent the ultimate in excellence in amateur sports — that's one of the real values of intercollegiate athletics. It's great for the spirit and morale of the country to have this demonstration of physical excellence at the collegiate level. At the Naval Academy, all those advantages accrue as well and to us have additional meaning. Intercollegiate sports impart those values a military leader must have to a large degree." Admiral Lawrence has been the recipient of two of this nation's most prestigious athletic awards — the National Football Foundation and Hall of Fame's Gold Medal and the Theodore Roosevelt Award from the National Collegiate Athletic Association (NCAA).

The roll call of varsity "N" winners at the Naval Academy reads like a veritable Who's Who in America — Rear Admiral Alan B. Shepard, the first American in space and a member of the heavyweight crew; Admiral Stansfield Turner, ex-football lineman who became director of the Central Intelligence Agency; Admiral Arleigh Burke, a wrestler who later was Chief of Naval Operations; Rear Admiral Richard Byrd, polar explorer, who was captain of the gymnastics team; Fleet Admiral Chester Nimitz, also a former Navy oarsman; and Fleet Admiral Bull Halsey, a football player at the Academy.

The exploits of Navy teams in competitive athletics are well-chronicled. Over the years, midshipmen have carved a reputation for excellence throughout the sports spectrum from football to fencing, sailing to squash, and golf to gymnastics. Two Navy football players — halfback Joe Bellino and quarterback Roger Staubach — won the Heisman Trophy, the college gridiron's most coveted individual prize, within a period of four years. In

NAVY
89
63

"A diploma from this place is going to open a lot of doors—in the Navy and out."

NAVY

Beat
ARMY!
Beat
ARMY!
Beat
ARMY

NAVY

PENN
STATE

HI
NAVY
20
45

"Intelligence is necessary but I think the best quality for a woman midshipman is common sense . . . someone who is independent, who likes to stand on her own two feet . . . is athletic."

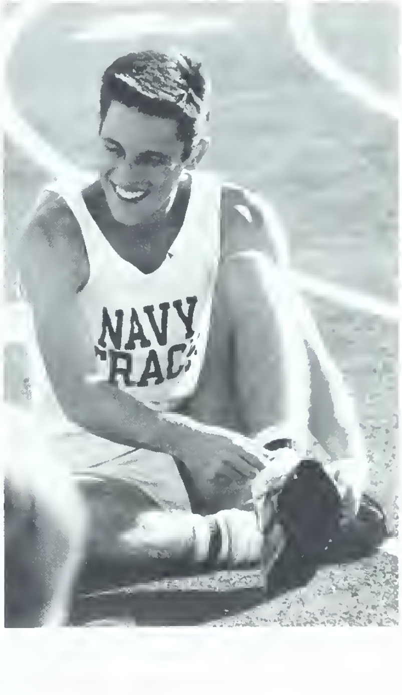
1985, running back Napoleon McCallum received first-team All-American recognition and was seventh in the voting for the Heisman after setting two NCAA career records. Many Navy athletes have been awarded NCAA graduate scholarships, the latest going in 1985 to Stefani Green, a four-time All-American in women's track. Two-time pistol All-American Stuart Munsch was a Rhodes Scholar in 1985. During the 1984–85 season, 25 varsity athletes received All-American recognition. These ranged from first-team selection to honorable mention, and included selection to Academic All-American teams.

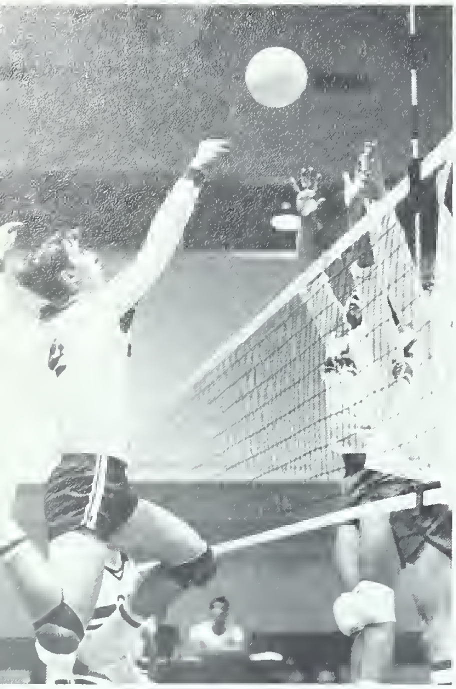
Football at the Naval Academy dates from 1879, just ten years after Rutgers and Princeton introduced the sport at New Brunswick. The midshipmen have participated in the Rose, Sugar, Cotton, Orange, Holiday, Garden State, and Liberty Bowls, including three bowl appearances in a four-year period in the past decade. Of course, nothing better symbolizes the Naval Academy athletic program than the Army-Navy football game, a sports event in the same galaxy as the World Series, the Kentucky Derby, and the Rose Bowl.

Navy heavyweight crews captured the Olympic gold medal for eight-oared shells at Antwerp, Belgium, in 1920, and in Helsinki, Finland, in 1952. Navy's heavyweight crew has won the Jim Ten Eyck Trophy at the Intercollegiate Rowing Association Championships three times already in this decade, and the Midshipmen have been four-time winners of the Head-of-the-Charles Regatta in recent years.

In 1976, a Naval Academy graduate, Captain Lloyd Keaser, USMC, won an Olympic silver medal in wrestling. Academy pistol teams have won national intercollegiate titles for the past eleven years. A member of the Class of 1983, Leo Williams, was a four-time All-American in indoor track and a two-time All American in track and field in the high jump.

Navy's basketball team won more games in 1984–85 than any service academy ever has in a season—26—and went on to gain a berth in the NCAA Tournament. That team led the nation in field goal percentage and was ranked in the top 15 in the country in four other statistical categories. In


NAVY
TRACK



"The thing that made up my mind when I visited Annapolis was the all-around program."

addition, Navy teams in men's cross country, water polo, fencing, baseball, lacrosse, and golf have been invited to NCAA championships in recent years.

The Naval Academy's sailing team gives midshipmen opportunities to develop leadership and seamanship skills through competition in numerous intercollegiate and private regattas. Competition ranges from single-handed Lasers to 50-foot ocean racers with a crew of 14. The Academy sponsors many of these regattas, including the McMillan Cup and the John F. Kennedy Memorial Regattas in the yawls. There are dinghy regattas almost every weekend. From 1977–1983, the Naval Academy won the Fowle Trophy, emblematic of overall intercollegiate sailing supremacy in North America, an unprecedented feat in this sport.

There is enough variety in Navy's intercollegiate lineup to satisfy virtually everyone's athletic tastes. In the fall, there is football, men's and women's cross country, women's volleyball, soccer, 150-pound football, water polo, and sailing. Winter is the most active time of year with men's and women's basketball, men's and women's fencing, men's and women's gymnastics, pistol, rifle, squash, men's and women's swimming, men's and women's track, men's volleyball, and wrestling. The spring schedule includes baseball, heavyweight crew, lightweight crew, women's crew, golf, lacrosse, sailing, tennis, and men's and women's track.

Army traditionally is Navy's top opponent, and the service rivals clash in a total of 21 varsity engagements during the academic year. Annapolis teams also face the perennial collegiate standouts in every sport—Notre Dame in football, Columbia in fencing, Lehigh in wrestling, Harvard, and Pennsylvania in crew, Johns Hopkins in lacrosse, and UCLA in water polo, to name a few.

But perhaps even more a part of Annapolis life is the competition within the Brigade represented by the intramural sports program. Every midshipman, with the exception of varsity athletes, must take part. Here all can participate, each at a level appropriate to their individual athletic ability. Women may participate in all but football, fieldball, lacrosse, boxing, rugby, and wrestling. Intramural sports at the Academy include:

Basketball
Boxing
Coed basketball
Crew
Cross country
Fencing
Fieldball
Football
Knockabout sailing
Lacrosse
Powerlifting
Rugby
Soccer
Softball
Squash
Swimming
Team handball
Tennis
Touch football
Track
Ultimate frisbee
Volleyball
Water polo
Wrestling

Excellent physical facilities support the program. Navy-Marine Corps Memorial Stadium, seating 30,000 fans, was dedicated in 1959. Halsey Field House, completed in 1957, is surfaced throughout with Tartan and includes a 220-yard indoor track. There are more than 70 acres of lighted playing fields, three indoor swimming pools, a 5,000-seat baseball park, a challenging 6,217-yard championship golf course, and an impressive array of tennis, squash, and volleyball courts.

A synthetic-surfaced field provides an all-weather practice area for football, lacrosse, and soccer, and an indoor skating rink provides for hockey and other skating activities. The Robert Crown Sailing Center and adjacent Santee Basin provide unexcelled collegiate sailing facilities. Here, over 120 craft, ranging from sailboards to ocean racers, are berthed for use by the midshipmen. A modern 400-meter synthetic-surfaced outdoor track was completed in 1980. Lejeune Hall, built in 1982, includes an Olympic-sized pool with seating for 1,000, a diving platform and tank, a 600-seat wrestling arena, and an array of conditioning areas.

The athletic program is administered by the Naval Academy Athletic Association, a non-profit organization with headquarters in Ricketts Hall at the Naval Academy. The Association arranges varsity schedules and provides coaching staffs and equipment.

"Some of my friends went to good schools, MIT, Brown, places like that . . . Others who were good in athletics went to a jock school. I get the best of both here."

CHAPTER 10

Extracurricular Activities

Midshipmen have a wide choice of more than 70 extracurricular activities (ECAs) at the Academy. Almost all are organized and run by the midshipmen themselves.

Extracurricular activities at the Naval Academy fall into several basic areas: athletic, professional, recreational, musical, religious, academic, publications and printing, and Brigade support. Midshipmen are encouraged to take part in as many activities as their interests and time allow.

Athletics are, and always will be, an important facet of Academy life. Aside from the many varsity and intramural sports available, midshipmen may join Boxing, Powerlifting, Judo, Karate, Trap and Skeet, and Bicycle Racing Clubs. Team-oriented "sport" ECAs include the Bowling Club, the men's Rugby and Ice Hockey Clubs, and the women's Tennis and Softball Clubs. These sport clubs compete against other college and private teams in the mid-Atlantic area and, as is often the case, against the Air Force Academy and West Point. The nationally ranked Rugby Club traveled to England in 1985 for a week of hard-hitting tournament play. When the Ice Hockey team, host of the annual Crab Pot Tournament, takes to the home ice, midshipmen and Annapolis-area fans turn out in force to support this popular winter ECA. Although considered ECAs at the Academy, sport clubs' members may earn athletic letters, similar to varsity athletes.

Midshipmen may join one of the Academy's professional ECAs to learn more about careers in the Marine Corps or one of the Navy's branches. Whether it is the Semper Fidelis Club, Surface Action Group, Dolphin or Flying Club, midshipmen have the opportunity to meet with Marine and Navy officers on both a social and a professional basis.

The Scuba Club, one of many recreational ECAs at the Academy, offers basic scuba diving courses and eventual PADI qualification. Over 200 divers are trained each year by certified instructors in basic and advanced diving. Once qualified, midshipmen can enjoy club-sponsored trips during weekends or leave periods to the Florida Keys, Virgin Islands, or Bermuda, and to submerged wrecks off the coasts of North Carolina, New Jersey, and Maryland.

The Military Parachute Club, better known as the Airborne Training Unit, is another popular ECA at the Academy. The club has two purposes: to give qualified parachutists the opportunity to make several military (static-line) jumps throughout the year and, secondly, to prepare midshipmen in the basics of military parachuting when they are selected to attend the Army Jump School in Fort Benning, Georgia, or at the Navy Jump Center in

Y BASKETBALL

"It turns out that there are a lot of ways to express yourself here. Just this year, for instance, I belong to the Scuba Club and the Chess Club. There's something for everyone."

Lakehurst, New Jersey, over their summer leave. About 60 midshipmen each year earn military jump wings.

The Academy's Drill Team—highly-acclaimed for their precision, close-order drill—perform at various events during the year including half-time shows at home football games. They've received many awards for their routines.

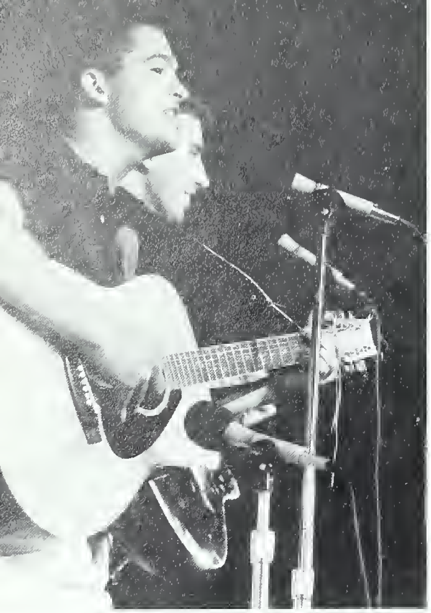
Sportsman Club members hunt, fish, camp, hike, and backpack. The abundance of streams, lakes, and trails within easy traveling distance from Annapolis make this club a favorite with midshipmen.

Other recreational ECAs include the Archery Club, Microcomputer Interest Group, the Orienteering Club, and the Photography Club, to name a few.

Musical activities support the Brigade and are a favorite pastime for hundreds of midshipmen. The Drum and Bugle Corps is a primary musical group within the Brigade. The 150-member Corps, which won the 1985–86 Interservice Academy Championship, performs field shows and pep music at home and away football games, as well as at many other Academy events. It represents the Academy and the Navy by appearing at professional football games and marching band competitions. In 1985, the D & B performed at the NCAA Suntory Ball basketball tournament in Japan.

The Trident Brass entertains with contemporary jazz, rock, swing, and stageband music at concerts and dances throughout the year. There are also a number of small combos and a Midshipmen Modern Music Band that plays Top-40's music.

Three choirs provide music for the various Chapel services. During the Christmas season the combined choirs traditionally perform Handel's "Messiah." There are also men's and women's Glee Clubs that perform a



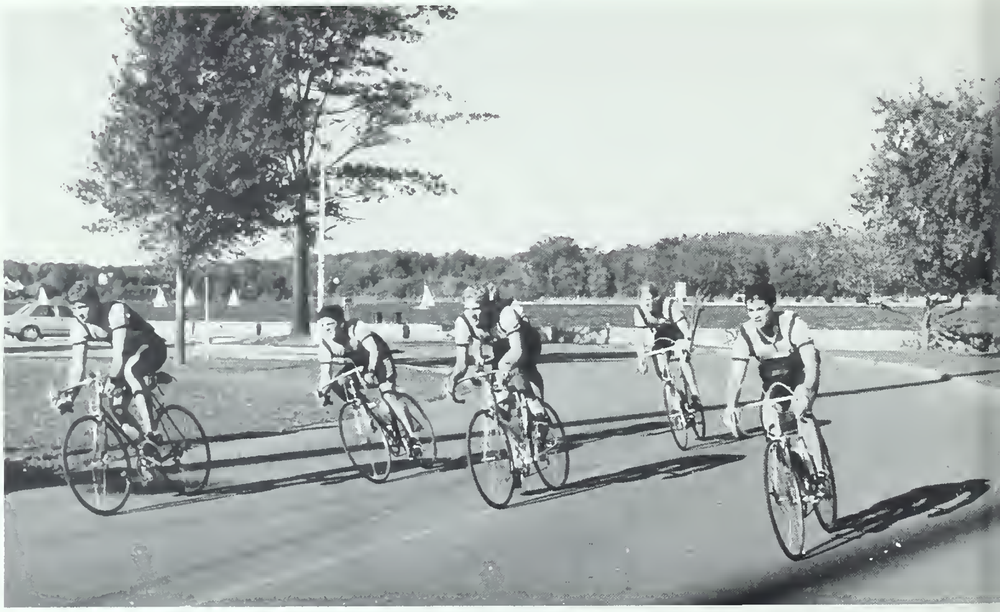
variety of musical styles ranging from classical to folk, and pop to Broadway show tunes. The groups make two week-long tours annually, travelling throughout the United States. In the spring the Clubs co-present the Glee Club musical, a favorite among Annapolis-area residents.

Virtually all faiths are represented and supported in the Brigade through approved religious ECAs. Midshipmen participate in organized Bible studies and other religious activities with the aim of enhancing and furthering moral development.

Academic ECAs augment studies in many ways at the Academy. The History Club sponsors eminent speakers and shows movies of historical interest to members of the Brigade. The International Club—with Chinese, French, Russian, and Spanish sections—sponsors formal banquets with distinguished foreign visitors speaking in their native language; field trips to foreign ships, diplomatic receptions, plays, films, and exhibits; and the Naval Academy's International Ball, attended each year by midshipmen and hundreds of young people from Washington's international community. Members of the Forensic Society compete at district and national levels in nearly 40 intercollegiate debate tournaments each year. These include an Academy-sponsored debate tournament in the spring attended by many of the top debate teams in the country.

Star-gazers are attracted to the Astronomy Club, which makes use of the computer-equipped planetarium to study celestial formations and phenomenon. The Masqueraders attract midshipmen interested in the theatre. One play is presented each fall, and many club members assist with the Glee Club musical in the spring. Midshipmen roles include directing, acting, promotion, and back-stage support. Midshipmen, faculty, and citizens from the Annapolis area attend these performances.

Other academic ECAs represented include a number of nationally recognized clubs and societies. Among them are the American Institute of Aeronautics and Astronautics, the Institute of Electrical and Electronics Engineers, the American Society of Mechanical Engineers, the American Society of Naval Engineers, the American Nuclear Society, the Society of Women Engineers, and the Society of Naval Architects and Marine Engineers,



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to name a few. The various honor societies include Tau Beta Pi (engineers), Sigma Pi Sigma (physics), Omicron Delta Epsilon (economics), Phi Alpha Theta (history) and Pi Sigma Alpha (political science). Phi Kappa Phi recognizes superior scholarship in all the major fields of study at the Naval Academy.

Members of the Brigade publish the *Lucky Bag*, the world's largest all-color yearbook for each graduating class; the *Trident Calendar,* a favorite Christmas gift embellished with photographs and cartoons; *The Log*, a humor and sports magazine featuring campus wit; and *Reef Points*, the "Plebe Bible," a pocket-size guide to the Academy and Navy customs, lore, and traditions. *Reef Points* also serves as a good dictionary for friends and family trying to decipher letters from midshipmen.

Brigade and community support ECAs are as diverse as they are popular. Besides the musical groups, the Brigade Activities Committee supports the Academy's intercollegiate sports program with pep rallies, Mr. Bill the Goat—a human mascot, a 16-foot hot-air balloon, skits and stunts, and other of their spirit-related innovations. Several midshipmen, sporting nineteenth-century uniforms, support the football team with an 1863 boat howizter. These "Cannoneers" discharge a round for each successful football scoring drive.

The Brigade Social Affairs Committee, a multi-faceted club, is comprised of the Hop Committee (responsible for all dances), Disco Committee (responsible for the fully-equipped disco booth in Dahlgren Hall), Juice Gang (lighting specialists), and the Ring Dance Committee (responsible for the Second Class Ring Dance).

Other support activities include a licensed stereo radio station (WRNV), Big Brother-Big Sisters, the Public Relations Committee, Ring and Crest Committee, and the Midshipmen Action Organization, who sponsors the Special Olympics at the Academy each year.

The broad range of extracurricular activities at the Academy offers something for everyone. Whether for professional enrichment, entertainment during leisure-time or just plain fun, the ECA program at the U.S. Naval Academy is an important adjunct to other programs offered in support of the Academy's mission.

"The Academy helps you develop into a well-rounded person. Academics and physical fitness are emphasized, but then so are a sense of honor and responsibility. The Academy helps you grow as a person by continually challenging you to do better."

CHAPTER 11

Administration, Faculty and Staff

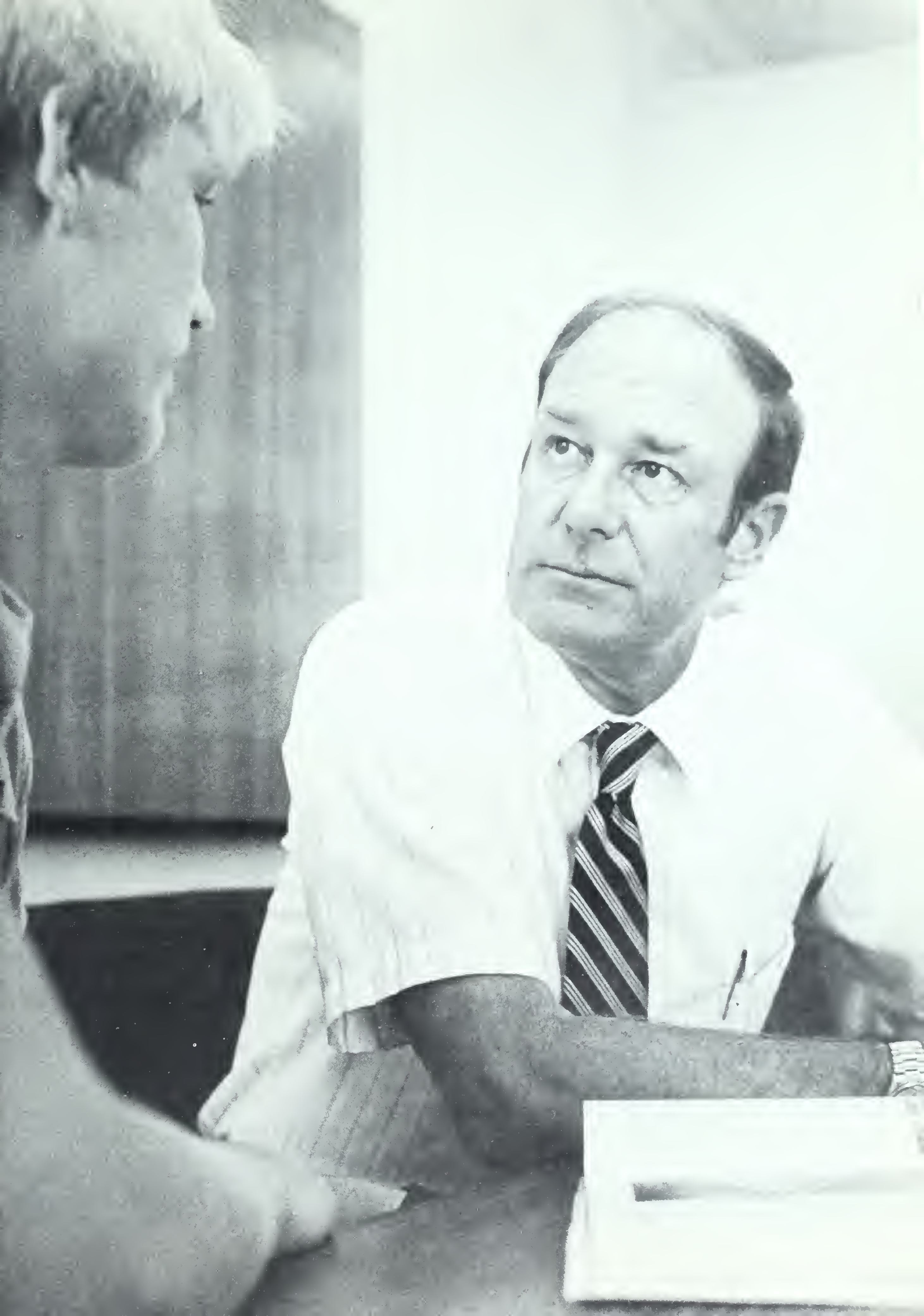
The administration of the Naval Academy is similar in many respects to that of a civilian college. A Board of Visitors performs the broad supervisory functions of a board of trustees. The Superintendent, a flag officer in the Navy, is the equivalent of a college president, and acts as the executive head of the Academy. He is assisted by the Commandant of Midshipmen, a senior naval officer whose function is somewhat like that of a dean of students; a civilian Academic Dean; and an administrative staff. The Superintendent, the Commandant, the Academic Dean, and other senior members of the faculty comprise the Academic Board, which makes major academic decisions and sets the academic standards for the Academy. Military, professional, and physical training come under the Commandant. The Academic Dean heads the academic program.

Today's 600-member Naval Academy faculty is an integrated group of officers and civilians in approximately equal numbers. The officers, rotated at intervals of two to three years, provide a continuing input of new ideas and experience from the Fleet. The civilians provide a core of professional scholarship and teaching experience, as well as continuity to the educational program.

The Board of Visitors

Appointed annually, the Board of Visitors to the Academy consists of the chairman of the Committee on Armed Services of the U.S. Senate, or his designee; three other members of the Senate designated by the Vice President of the United States or the President *pro tempore* of the Senate, two of whom are members of the Committee on Appropriations of the Senate; the chairman of the Committee on Armed Services of the U.S. House of Representatives, or his designee; four other members of the House of Representatives, two of whom are members of the Committee on Appropriations of the House of Representatives; and six persons designated by the President of the United States.

The Board meets at least once, but usually twice, each year at the Naval Academy. Board of Visitors members inquire into morale and discipline, the curriculum, instruction, physical equipment, fiscal affairs, academic methods, and related matters. The President of the United States receives a written report of its findings and recommendations.



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The Academic Advisory Board was formed by the Secretary of the Navy to advise the Superintendent concerning the Academy's academic program. Meetings are held periodically during the year.

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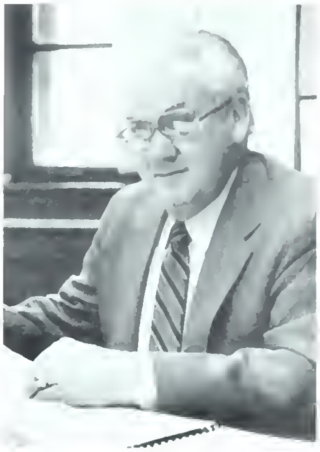

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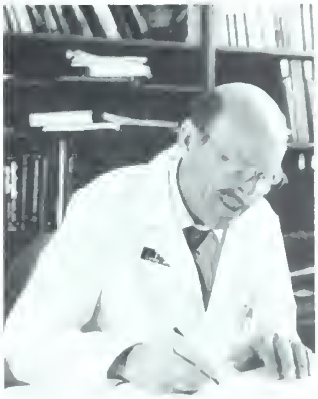
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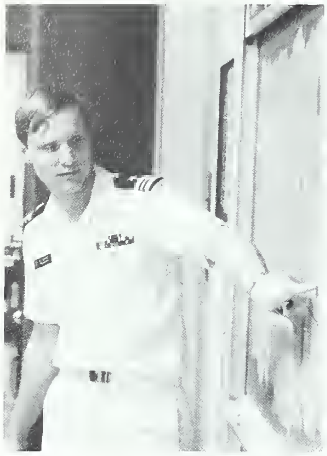

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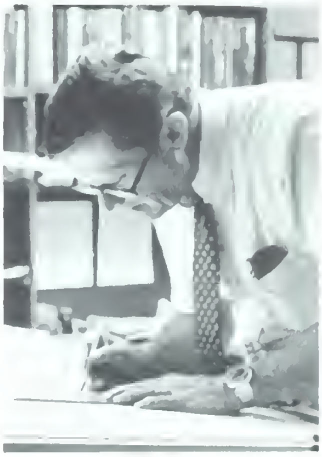
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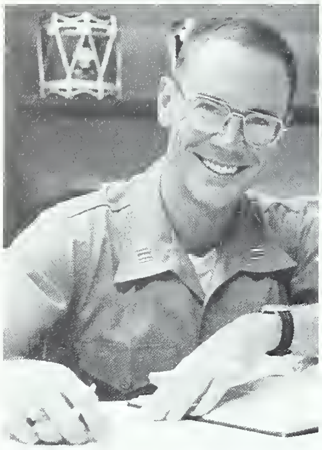
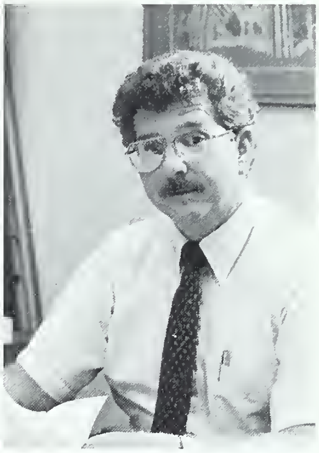


Captain Underwood



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Ensign Kendall

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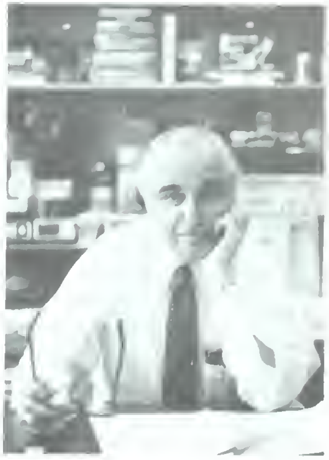
Captain Katz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Coach Smalley

Lieutenant Commander Youree

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M.A., Eastern Michigan University
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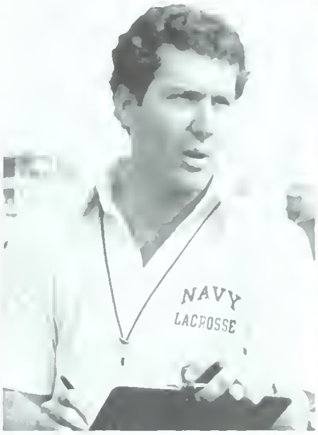
M.S., Mankato State College



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Associate Professor Cantello

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CHAPTER 12

Honors, Awards, and Organizations

Honor Societies

Phi Kappa Phi recognizes superior scholarship in all fields of study. The Naval Academy chapter elects up to six percent of the midshipmen of each class to membership of which half are nominated as second classmen and the remainder in their first class year. These candidates represent the top scholars in each of the 18 majors offered at the Academy. Although the emphasis is on scholarship, excellence of character is recognized as an inseparable attribute for membership.

Sigma Pi Sigma, the Physics Honor Society, is an affiliated society of the American Institute of Physics and of the American Association for the Advancement of Science. Midshipmen candidates for membership must have completed not less than three semesters of physics with at least a B average, and must be in the upper one-third of their class in general scholarship. The Naval Academy chapter meets monthly to hear invited speakers, and participates in a variety of projects. The chapter worked with scientists from the Naval Research Laboratory in Washington, D.C., to design and construct two cosmic ray experiments aboard the Space Shuttle in 1984 and 1985.

Sigma Xi, the Scientific Research Society, is an honor society which encourages original investigation in the fields of pure and applied science. The Naval Academy chapter includes members from the professional staffs of the Academy and the David W. Taylor Naval Ship Research and Development Center's Annapolis laboratory. Monthly meetings feature distinguished speakers from many scientific fields. Graduating midshipmen who have distinguished themselves as Trident Scholars or in other research-oriented work of the Academy may be recommended for associate membership.

Tau Beta Pi is the National Engineering Honor Society. The top fifth of senior engineering majors and top eighth of junior engineering majors are eligible for membership. The society recognizes students of superior scholarship and outstanding character. Presentations, guest speakers, and field trips are sponsored by the local chapter.

Pi Tau Sigma is the National Mechanical Engineering Honor Society. Midshipmen majoring in mechanical engineering who stand in the upper third of their class as seniors or the upper fifth as juniors are eligible for membership.

"The Navy and Marine Corps' power and forward deployment puts them on the front lines of deterrence. The leadership and judgment of naval officers, serving in the far reaches of the globe, are critical to our success as a nation."

President Ronald Reagan

Phi Alpha Theta is the International Honor Society in History. Membership includes both faculty and students. Activities of midshipmen elected to the local chapter include forums, seminars, guest speakers, and the presentation of papers at regional meetings of the society.

Omicron Delta Epsilon is the International Honor Society in Economics. In addition to recognition of scholastic attainment, the society provides an opportunity for students to publish in its journal, *The American Economist.* Midshipmen candidates for election to the Naval Academy chapter must have an overall scholastic average of B and at least twelve credits in economics with a B average or better. They do not have to be economics majors.

Pi Sigma Alpha is the National Honor Society in Political Science. To be eligible for membership, midshipmen must stand in the upper one-third of their class with a B or better average in at least 15 hours of political science courses.

Sigma Iota Epsilon is a national honorary professional management fraternity affiliated with the Academy of Management. Midshipmen majoring in applied science who have completed 30 semester hours with at least a B average are eligible for membership in the local chapter. The fraternity is active in advancing scholarship and research through the development of the scientific approach to the solution of management problems.

Prizes and Awards

Each Commissioning Week more than 80 prizes and awards, provided by individuals and a wide variety of organizations, are presented to deserving midshipmen in recognition of their noteworthy accomplishments in such

areas as academics, leadership, professional studies, debate, public speaking, sailing, marksmanship, and athletics.

U.S. Naval Academy Alumni Association

The U.S. Naval Academy Alumni Association, Inc., is a private organization whose mission is to serve and support the United States, the naval service, and the Naval Academy by furthering the high standards of the Naval Academy; by seeking out, informing, encouraging, and assisting qualified young men and women to enter the Naval Academy and to pursue careers in the regular Navy and Marine Corps; and by initiating and sponsoring activities which perpetuate the history, traditions, and growth of the Naval Academy and which bind its alumni together in support of the highest ideals of command, citizenship, and government.

All former midshipmen of the Naval Academy are eligible for membership in the Association. Associate membership is available to a limited number of persons who have demonstrated their interest in and support of the Navy, the Naval Academy, or the Alumni Association.

National headquarters of the more than 24,500-member association is located in Alumni House, just a block outside the Academy's gate. Con-

"This place has prestige. Americans admire someone who graduates from the Naval Academy. And I've got a foundation that will last me the rest of my life. I can build from this point because I made my mark here mentally, not just athletically."

"Saluting, the discipline, the uniforms. It doesn't bother me. I've kept my personality and my individualism. I haven't changed. All that stuff is just part of the game. When I graduate, it'll all be worthwhile. I've made friendships that will be with me forever. And I will have a job when I graduate."

structed in 1739, and originally named Ogle Hall, it has served as the home of three Maryland governors. Alumni House has been beautifully restored and furnished by members of the Association. Files and records are maintained there on all who have taken the oath of office as midshipmen at the Naval Academy since its founding in 1845.

In addition to serving its members through such activities as publication of an annual *Register of Alumni*, publication of the monthly alumni magazine, *Shipmate*, support of class and chapter organizations, and the offering of group life insurance, medical, and investment programs, the Alumni Association engages in fund raising and serves as a major source of private funds for the many needs of the Academy and the Brigade which cannot be met by federal funding. The Alumni Association is also the designated coordinator for all other organizations supporting the Naval Academy, including parents clubs.

U.S. Naval Institute

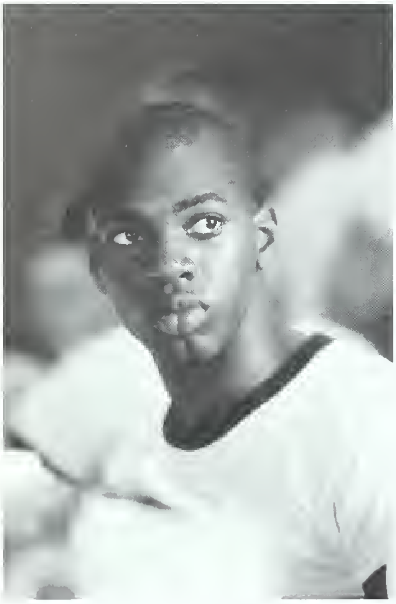
With headquarters in Annapolis, the U.S. Naval Institute is the professional society of the seagoing services. It is a private, nonprofit association of more than 71,000 members. Formed in 1873 for "the advancement of professional, literary, and scientific knowledge in the Navy," membership includes officers and enlisted personnel from all branches of the U.S. military services, distinguished officers of foreign navies, and U.S. and foreign citizens interested in events and developments throughout the worldwide maritime community. Members pay annual dues and receive the Institute's monthly professional journal, *Proceedings*, and are entitled to purchase Naval Institute books, as well as those of certain other publishers, at reduced prices.

The Institute's books include texts on professional naval subjects, training guides and manuals, scientific and technical works, and studies in naval history.

Marine Navigation 1
Piloting
Richard R. Hobbs
15

APPENDIX A

Form Letters



"It's definitely a way for blacks to get ahead, but you have to be prepared to sacrifice the 'good life' for awhile in order to attain your goals."

Requesting a Congressional (or Vice Presidential) Nomination *(Sample letter)*

Honorable ____________________
House of Representatives
Washington, D.C. 20515

Honorable ____________________
United States Senate
Washington, D.C. 20510

Dear ____________

It is my desire to attend the United States Naval Academy. I respectfully request that I be considered as one of your nominees for the class entering in the summer of 19____.

The following personal data are provided for your information:

Full name ____
(Print as recorded on birth certificate)

Name of parents ____
Address: (Use Zip Code and and phone number)

Permanent	Mailing
____________________	____________________
____________________	____________________
____________________	____________________

My date of birth: ______________ Place of birth: ______________
Social Security number: ________________________________
High School attended: ________________________________
(Name and address)

Date of high school graduation: ____________________ Sex: ______________

My approximate standing is ____________________ in a class of ______________

I have/have not sent a Precandidate Questionnaire (see page 70 of this catalog) to the Naval Academy. Apply to Vice President *only* if highly qualified.

I have requested my high school transcript of work completed to date be forwarded to your office as soon as possible. I have also listed on the reverse side the results of any ACT or College Board test scores that I have taken.

I have been active in high school extracurricular activities as indicated on the reverse side. I should greatly appreciate your consideration of my request for one of your nominations.

Sincerely yours,
(Signature)

Notes: Do not forward transcripts/supporting letters to the Vice President's Office. Forward to the U.S. Naval Academy Admissions Office, marked "VP Nomination."
Prospective candidates should apply to their U.S. representative and to *both* of their U.S. senators.
If you have not already filled one out, a Precandidate Questionnaire should be requested from the Director of Candidate Guidance (Code 304), U.S. Naval Academy, Annapolis, Maryland 21402-5018, at the same time that applications for Congressional nominations are submitted.

"I automatically respect a girl more if she is wearing the Academy uniform than I would if I saw the same girl in civilian clothes. They've got to be outstanding to make it here."

Requesting a Presidential Nomination

(Sample letter. See below & Chapter 3 for eligibility.)

(This application should be submitted after July 1 of the year preceding desired year of entry and before February 15 of the year of entry.)

To: Director of Candidate Guidance (Code 304), U.S. Naval Academy, Annapolis, Md 21402-5018

Dear Sir: Date ______

I request a Presidential nomination to the United States Naval Academy for the class which will enter in the summer of 19____ and submit the following data:

Name: ______
(Give full name as shown on birth certificate or, if changed, attach copy of court order.)

Address: *(Use Zip Code and provide phone number.)*

Permanent ______ Temporary ______
______ ______
______ ______
Phone ______ Phone ______
Date of birth: Social Security number: ______
(Spell out month) *(Must be filled in)*

Name & address of high school/college: ______
Month/year of graduation: ______ Sex: ______ Ethnic origin: *Black, Oriental, Hispanic, native American (American Indian and native Alaskan), Puerto Rican, Caucasian, etc*
______

Congressional District & State: ______
Applying to Congressmen (names) ______
Highest scores: PSAT V______, M______; SAT V______, M______; ACT V______, M______
Uncorrected vision: Right 20/______, Left 20/______, Corrected R 20/______, L 20/______

If member of military, check box ☐. List rank, serial number, component, branch of service, and organizational address on reverse side of this form.

Information Concerning Parent's Military Service:

Name of parent: ______
(Parent's rank, serial number, component, and branch of service)

Sincerely yours,
(Signature)

Note: In establishing your eligibility for a Presidential nomination, you should determine which of the following three service-connected categories applies *to your parent*, and forward supporting documents and information to the Naval Academy along with your letter of application for a nomination. If you have not already filled one out, you should request a Precandidate Questionnaire from the Director of Candidate Guidance, U.S. Naval Academy, Annapolis, Maryland 21402-5018, at the time you apply for a Presidential nomination.

☐ Active duty officer: (Attach statement of service prepared by personnel officer specifying all periods of active duty.)
☐ Active duty enlisted: (Attach statement prepared by personnel officer specifying all periods of active duty and listing dates of enlistment and dates of expiration of enlistment.)
☐ Retired or deceased: (Furnish data and copy of retirement order or casualty report. If appropriate, include brief statement concerning the date, place and cause of death or the details of disability together with the Veterans Administration claim number. If eligible, applicant will be given a nomination in the Children of Deceased or Disabled Veterans category.)

APPENDIX B

Special Medical Considerations

"In athletics, just like life, you've got to accept the fact that things don't always go your way. The main thing is to work hard at improving yourself. That way when your opportunity does come—and it will!—you'll be ready."

Roger Staubach
Class of 1965

The medical condition of every applicant is reviewed very carefully. Insofar as is possible, appointments will not be offered to applicants who have physical problems which would interfere with full participation in the rigorous physical training integral to the curriculum, be aggravated by the program, or preclude the expectation of unrestricted service after graduation.

The following special medical examination considerations below are explained so that candidates, prospective candidates, and their private physicians and dentists may know the basic medical requirements for entrance to the Academy.

Many candidates have conditions which cause them to be not qualified for admission according to these physical standards. Some of these medical requirements, however, are waiverable. Each individual's situation in this regard will be explained after review of the physical examination report. Candidates with waiverable conditions are allowed to compete for admission. If, despite the identified waiverable condition, their record suggests greater potential for success at the Academy and for effective service after graduation than is apparent with candidates who are physically qualified, a waiver for the condition will be granted and the candidate will be able to accept appointment. One should not infer from this that medical considerations do not weigh heavily in the admissions process. They are very important, and some physical problems are absolutely disqualifying and cannot be waived. Beyond these, however, the presence of a waiverable condition is just one of the many factors considered by the Admission Board.

Medical History. The medical history will be compiled with particular care and with elaboration where indicated. Inquiries will be made in detail concerning all illnesses, injuries, and operations which candidates may have had. Failure to fully document these items can result in disappointment should related medical disqualification be determined later. A history of familial diseases will be investigated thoroughly. If the candidate has received medical care which has significantly affected his physical condition, he will be required to submit evidence from attending physicians or from hospital records concerning this medical care. *A candidate who has defects that are remedial, including dental defects, should have them corrected prior to taking the medical examination.*

"The black often feels he doesn't have a chance to get in here. Many blacks believe they need economic or political influence. They don't. And they underestimate their own abilities."

Weight Standards (Men)

Height	62	63	64	65	66	67	68	69	[illegible]	[illegible]	[illegible]	[illegible]	74	[illegible]	[illegible]	[illegible]	[illegible]
Weight:																	
Minimum	103	104	105	106	107	111	115	119	124	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Maximum	168	174	179	185	191	197	203	209	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Weight Standards (Women)

Height	60	61	62	63	64	65	66	67	68	69	[illegible]	[illegible]	[illegible]	[illegible]	74	[illegible]	[illegible]	[illegible]	[illegible]
Weight:																			
Minimum	94	96	98	100	102	104	106	109	112	115	118	[illegible]	[illegible]	128	[illegible]	136	[illegible]	[illegible]	[illegible]
Maximum	125	127	130	134	138	142	147	151	156	160	165	[illegible]	[illegible]	180	184	189	[illegible]	[illegible]	[illegible]

Waivers for height for applicants who fall outside these limits (high or low) may be granted by the Admissions Board to a limited number of candidates. Likewise, these weight standards are necessarily arbitrary, and waivers may be granted in unusual cases. Obesity is disqualifying. Candidates who are not within qualifying weight limits on the day of admission to the Naval Academy risk medical disqualification. Height and weight *are* checked on Induction Day.

Eyes and Vision. Uncorrected visual acuity of 20/20 in each eye is a basic requirement. However, waivers may be granted to a limited number of candidates with exceptional scholastic and leadership achievements whose eyes are without excessive refractive error and will correct to 20/20 with eyeglasses (not contact lenses). (Technically, in evaluating the degree of refractive error, the strength of the lens required to correct the vision to 20/20 must not be greater than ± 5.50 diopters in any meridian, there cannot be more than 3 diopters of astigmatism present, and the maximum difference in power between the eyes may not exceed 3.5 diopters.)

Candidates who wear eyeglasses or contact lenses should bring them along when they receive their medical examination. Hard and gas-permeable contact lenses must be removed 21 days prior to the medical examination, and soft contact lenses must be removed 3 days prior to the medical examination. Both eyes must be free from any disfiguring or incapacitating abnormality and from acute or chronic disease. Keratoconus is disqualifying. Radial keratotomy, keratomileusis, orthokeratology, and other surgical or mechanical procedures undertaken to correct visual acuity are disqualifying. Color perception must be normal and will be retested on Induction Day. No waivers for defective color vision will be granted.

Heart and Vascular System: An electrocardiogram is required of all candidates. The following conditions require complete medical evaluation and may be cause for rejection: septal defects and organic valvular diseases of the heart, including those improved by surgery; EKG evidence of variations from normal heart beat; and hypertension evidenced by preponderant blood pressure readings of 140 mm or more systolic or 90 mm or more diastolic. The following are also causes for rejection: varicose veins, if severe or symptomatic; heart rate greater than 100 on repeated examinations; substantiated history of rheumatic fever with evidence of residual cardiac damage; and history of recurring rapid heart beat within the preceding five years (paroxysmal tachycardia).

Hemoglobin Variants: Sickle cell disease is cause for rejection. Sickle cell trait and glucose-6-phosphate dehydrogenase (G–6–PD) deficiency are not disqualifying.

Ears and Hearing: Auditory acuity of all candidates will be determined. Maximum acceptable hearing loss in decibels is as follows:

International Standards Organization (ISO)

Frequency (hz)	500	1000	2000	3000	4000	8000
	512	1024	2048	2896	4096	8192
Maximum level in decibels in either ear	Average level in these three frequencies in either ear not greater than 30 db with no level greater than 35 db in any one frequency			45db	60db	Recorded for baseline information only

Both ears must be free from any disfiguring or incapacitating abnormality and from acute or chronic disease.

"You have to look into the future and see what you want and, at the age of 18, that's not easy."

Nares: Septal deviation, hypertrophic rhinitis, or other conditions which result in 50 percent or more obstruction of either airway, or which interfere with drainage of a sinus on either side, are causes for rejection.

Skin: Chronic diseases such as severe acne, psoriasis, eczema, or significant congenital markings are cause for disqualification. Pilonidal sinus, if evidenced by presence of mass or discharging sinus, is cause for rejection until successfully repaired.

Serologic Tests: A serologic test for syphilis is required of all candidates. An active venereal infection, untreated or incompletely treated syphilis, and certain complications and permanent residuals of venereal disease are disqualifying.

Genitourinary System: Persistent or recurrent albuminuria of any type or the persistence of casts in the urine will be cause for rejection. Bed wetting persisting into early adolescence is cause for rejection. Other causes for rejection in men: marked phimosis or epispadias; pronounced hypospadias; atrophy, deformity, or maldevelopment of both testes; or an undescended testicle of any degree. Other causes for rejection in women are: bartholinitis; cervicitis; dysmenorrhea, if incapacitating to an appreciable degree; endometriosis; hermaphroditism; menopausal syndrome under certain conditions; menstrual cycle irregularities of certain types; new growths of the internal or external genitalia with certain exceptions; oophoritis; ovarian cysts; pregnancy; salpingitis; urethritis; certain abnormal conditions or diseases of the uterus, vagina, and vulva; major abnormalities and defects of the genitalia.

Neurological Examination: Evidence of degenerative disorders or conditions such as established migraine and history of significant motion sickness are causes for rejection.

"I spend zero time thinking of my plight in relation to the guys here. Being a midshipman takes so much energy that if you worried about your rights all the time, you wouldn't have time to do all the things you have to do."

Asthma: Asthma or recurrent asthmatic bronchitis by diagnosis or history after the 12th birthday are causes for rejection.

Abdominal Wall Examination: Hernia of any type is disqualifying until corrected. Other abnormal diseases and conditions which are not acceptable include stomach or small bowel ulcer or history of same, acute or chronic gall bladder disease, and removal of spleen for reasons other than trauma.

Miscellaneous Disqualifying Medical Findings: Acute communicable diseases; anemia; abnormal bleeding states; diabetes mellitus or history of diabetes in both parents; persistent sugar in urine, regardless of cause; ununited fractures; history of surgery to a major joint within past six months; history of derangement of any major joint not corrected by surgery, or evidence of instability subsequent to surgery; absence or loss of more than one-third of the distal phalanx of either thumb; tuberculosis, active in past five years; hay fever, if severe; nasal polyps; personality disorders; immaturity; stammering or stuttering; arthritis; and herniated nucleus pulposus or history of surgery to the spine for this or any other condition.

Dental Standards: A candidate for appointment must have a minimum of eight permanent teeth in each arch. All missing teeth causing unsightly spaces or significantly reduced masticatory or incisal efficiency must be replaced by well-designed bridges or partial dentures which are in good condition. Except for minor or questionable carious areas, all required dental treatment must be completed. Candidates undergoing active orthodontic treatment will be temporarily disqualified. Each such candidate will be considered on an individual basis by the Department of Defense Medical Examination Review Board. Disqualifying defects are as follows:

Lack of satisfactory incisal or masticatory function
Less than eight natural permanent teeth in each arch
Edentulous spaces which are unsightly or which significantly reduce masticatory function
Carious teeth, except minor or questionable carious areas
Infections or chronic diseases of the soft tissue of the oral cavity
Marked malocclusion which requires early or prolonged treatment, involves tissue impingement on either the facial or lingual/palatal gingiva, or in other ways jeopardizes dental health
Unsatisfactory restorations, bridges, or dentures
Severe or extensive apical or periodontal infection
Perforations from the oral cavity into the nasal cavity or maxillary sinus
Tumors or cysts of the oral tissues which require treatment or may require treatment in the foreseeable future

APPENDIX C

Foreign Students

"Somebody somewhere is always competing for something at the U.S. Naval Academy."

In 1983 a new law was enacted changing the number of foreign students at the academy from a total of 24 to 40 and making many more countries eligible for participation. Therefore, upon approval by the Secretary of Defense, the Secretary of the Navy may now authorize up to 40 persons at any one time from designated countries to receive instruction at the United States Naval Academy.

Not more than three persons from any one country may receive instruction at the same time. Applications for these appointments must be addressed through appropriate diplomatic channels. The appointments are competitive. Nominations must reach the Superintendent, U.S. Naval Academy, Annapolis, Md. 21402-5000, Attn: Nominations and Appointments Office, by January 1 of the calendar year in which entering.

Foreign nationals receiving instruction at the Naval Academy receive the same pay, and allowances, as other midshipmen; are paid from the same appropriations; and except for such modifications as may be determined by the Secretary of the Navy, are subject to the same rules and regulations governing admission, attendance, discipline, resignation, discharge, dismissal, and graduation, as midshipmen at the Naval Academy appointed from the United States. Foreign students are not entitled to appointment to any office or position in the U.S. Navy by reason of their graduation from the Naval Academy. An entrance deposit is required of all foreign students and their government will be required to reimburse the United States for the cost of instruction; unless charges are waived by the Secretary of Defense.

Each foreign candidate must:

☐ Be an unmarried, bona fide citizen of the nominating country and, unless otherwise approved by the Secretary of the Navy, be not less than 17 and not yet 22 years of age on July 1 of the calendar year of entrance to the Naval Academy.

☐ Possess medical qualifications as specified in appendix B of this catalog. After their arrival in the United States, all candidates must undergo a qualifying medical examination at the United States Naval Academy. Foreign candidates are urged to undergo careful preliminary examination by qualified medical personnel who are conversant with the physical requirements set forth in appendix B of this catalog before leaving their homes for the Naval Academy. Those with obviously disqualifying defects may thus be spared

"It all depends on what you want to do. Those who don't think it is worth the effort, don't make it."

the needless expense of the trip to Annapolis. In case of reasonable doubt as to whether or not the defects are disqualifying, it is recommended that a telegraphic inquiry be addressed to the Superintendent, U.S. Naval Academy, Annapolis, Md. 21402-5000, U.S.A., Attn: Nominations and Appointments Office.

☐ Be proficient in reading, writing, and speaking idiomatic English. Candidates may meet scholastic entrance requirements by submitting certificates from schools attended. They must also take either the American College Testing Program (ACT) test or the College Entrance Examination Board Scholastic Aptitude Test (SAT) and the Test of English as a Foreign Language (TOEFL) exam. Tests may be taken at any time they are offered, but not later than February of the year of admission to the Naval Academy. Due consideration is given to the fact that these tests are prepared in the English language and not in the native tongue of the candidate.

☐ Foreign students accepting an offer of appointment must obtain a (U.S.) Social Security account number. Appointee's local U.S. embassy can assist with this.

The naval attache or a diplomatic representative of the United States in the candidate's country must provide a report of the candidate's proficiency in the use of idiomatic English.

The *physical aptitude examination* is not administered to foreign candidates. In order to meet the physical fitness standards expected of midshipmen, however, foreign candidates should arrive in good physical condition. Men should be able to do two chin-ups, women a flexed-arm hang for twelve seconds, and everyone be capable of running at least two miles.

Governments should submit the names of candidates as early as possible in order that they may qualify for entrance by the end of April and enter the Naval Academy in early July.

In lieu of the oath of allegiance to the United States, a substitute oath will be required, in substance as follows:

I ____________________________, *a citizen of* ____________________________
having been permitted to receive instruction as a midshipman at the United States Naval Academy, do solemnly swear to comply with all regulations for the policy and discipline of the Naval Academy, and to give my utmost efforts to accomplish satisfactorily the required curriculum; do swear not to divulge any information of military value which I may obtain directly or indirectly in consequence of my presence at the United States Naval Academy to any alien government; and do agree that I shall be withdrawn from the United States Naval Academy if deficient in conduct, health, or studies.

Notification will be given to the governments concerned that students found by proper authority to be unsatisfactory in conduct, studies, or health will be accorded the same consideration given to other midshipmen regarding withdrawal from the Academy or repetition of a year's work.

APPENDIX D

Oath of Office and Entrance Day Procedures

"Midshipmen are pulled in three directions: officers serve as role models, faculty members stress academic involvement, and coaches require athletic participation. But together, the three areas give the Academy a quality program, one that demands a high level of accomplishment."

Professor J. Alan Adams

Candidates for whom there are vacancies and who have met the scholastic, medical, physical, and other requirements for entry, will be offered appointments as midshipmen and be admitted to the Naval Academy.

Each candidate for midshipman will be required to take the following oath of office upon entrance:

"I, ____________________________ having been appointed a midshipman in the United States Navy, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter; so help me God."

Midshipmen take the oath by holding up their right hand and swearing that they voluntarily accept its terms. They also sign their names as a record of their oath. This must not be a perfunctory procedure in any sense. Students should consider carefully and understand thoroughly their obligation.

Candidates are usually sworn in as midshipmen on the day they are accepted for admission, i.e., the date of reporting to the Naval Academy as designated in the *Permit to Report* issued by the Superintendent, U.S. Naval Academy. Living accommodations in the city of Annapolis are limited, and candidates are urged to time their arrivals in Annapolis to coincide as closely as possible with the reporting time and date. Transportation facilities between Washington and Annapolis and between Baltimore and Annapolis are also limited.

Midshipmen who are involuntarily separated from the Naval Academy prior to repayment of the entrance credit are required to turn in all uniforms and equipment suitable for reissue to an amount sufficient to liquidate their indebtedness. If reclaimed articles are insufficient to cover the indebtedness, parents will be given an opportunity to pay the remaining debt; failing this, the remainder of the debt is cancelled. Midshipmen applying for voluntary separation for their own convenience are required to repay in full the amount of indebtedness prior to separation.

Every candidate must present a Social Security card upon reporting for appointment. If an individual has not obtained a Social Security account number as a result of work experience prior to entering, one should be

"I'm glad I decided to come here because it has helped me to develop a sense of pride, both in myself and my country."

obtained based on expected employment as a midshipman. Foreign nationals should contact their local U.S. embassy to obtain their Social Security account number.

Upon entrance, midshipmen will be required to obtain a regulation entrance outfit from the Midshipmen's Store. Mechanical drawing sets are included in the outfit.

After being admitted to the Naval Academy, midshipmen receive travel and transportation allowances as prescribed in Joint Travel Regulations. Midshipmen will be reimbursed for the actual cost of their commercial transportation fares, government transportation was available. In those cases in which travel originates outside the United States, candidates must contact the nearest naval activity for information as to the availability of government transportation before arranging commercial transportation. When government transportation is not available, a certified statement to this effect must be presented in order for the candidate to be reimbursed after becoming a midshipman.

Candidates admitted as midshipmen are required to submit documentary evidence of birth to the Superintendent, U.S. Naval Academy. A certified copy of the public record of birth is the best evidence. A court order authorizing a name change will be required at entry *if the name on the evidence of birth is not identical to the current name of the candidate.* If such a court order is not presented, the name on the birth document will be used by the Academy. Except for candidates entering the Academy as citizens of certain foreign countries, as provided by law, all candidates born outside the United States must show proof of U.S. citizenship in the form of a Department of State, consular, or other governmental report of birth.

Each qualified candidate, before being admitted as a midshipman, must deposit with the Midshipmen's Store, U.S. Naval Academy, the sum of $1,000 to be used to cover, in part, the initial cost of uniforms, clothing and textbooks. The deposit is not refundable. This deposit should be in the form of a personal check, cashier's check, certified check, or traveler's check made payable to the Midshipmen's Store, U.S. Naval Academy. In hardship cases the deposit may be waived or reduced by the Registrar. Entrance deposits (or requests for waiver or reduction) should be mailed to the appropriate Naval Academy office in the pre-addressed envelopes provided after acceptance of appointment, but well in advance of Indoctrination Day.

APPENDIX E

Naval Academy Information Program

Academy Information Officers—some 1,500 in all—are Naval Reserve officers and civilians located throughout the country who have received specialized training in the Naval Academy's admission procedures. The officers are not on active duty but are in contact with officials at Annapolis throughout the year. Those interested in receiving counseling assistance should write or call the nearest Naval Academy Information Officer State/Area Coordinator to find out the name and address of their nearest Information Officer.

"I made a big commitment when I came to the Academy, but looking back, it seems like the best decision I've ever made."

State/Area Coordinators

ALABAMA
Captain John T. Natter
1774 Cornwall Road
Birmingham, AL 35226
Phone: Home 205-822-9181; Bus. 205-252-8473
Zip code areas 350- to 369-

ALASKA
Mr. Tom Teshara
USNA Office
NAS Moffett Field, CA 94035
Phone: Home 415-589-0247; Bus. 415-966-5931; Autovon: 462-5931
Zip code areas 995- to 999-

ARIZONA
Captain Donald F. Strand
3170 E. Ft. Lowell Road
Tucson, AZ 85718
Phone: Home 602-299-3065; Bus. 602-795-0520

ARKANSAS
Captain W. O. Kimbrough
2600 S. 46th Street
Fort Smith, AR 72901
Phone: Home 501-783-7733; Bus. 501-782-3035

CALIFORNIA
Mr. Tom Teshara
Naval Academy
Regional (Western)
Candidate Guidance Office
NAS Moffett Field, CA 94035
Phone: Home 415-589-0247; Bus. 415-966-5931
Zip code areas 939- to 951- and 954- to 955-

Captain Richard Berg
6615 Via Estrada
La Jolla, CA 92037
Phone: Home 619-459-8546
Zip code areas 920- to 922-

Captain John Gera, Jr.
10141 Jon Day Drive
Huntington Beach, CA 92646
Phone: Home 714-968-2074; Bus. 213-922-4256
Zip code areas 900- to 919- and 923- to 929-

Captain Arthur L. Hughes
5137 Brookview Court
Charmichael, CA 95608
Phone: Home 916-485-6698; Bus. 916-971-7151
Zip code areas 956- to 961- and 952- to 953-

Captain Robert G. Gorman
3813 Harvard Drive
Bakersfield, CA 93306
Phone: Home 805-871-1209; Bus. 805-322-3536
Zip code areas 930- to 938-

COLORADO
Captain Darrell Higman
2010 Wooten Lane
Colorado Springs, CO 80915
Phone: Home 303-574-9492; Bus. 303-520-2900
Zip code areas 800-, 801-, and 803- to 816-

Captain Eugene R. Roon
1525 Sherman Street, Suite 712
Denver, CO 80203
Phone: Home 303-755-3327; Bus. 303-866-3267
Zip code area 802-

CONNECTICUT
Commander Abner Oakes
35 Julian Drive
Hamden, CT 06518
Phone: 203-281-5823

DELAWARE
Captain Dawson Richardson
Wilmington Trust Company
Rodney Square North
Wilmington, DE 19890
Phone: Home 215-793-1546; Bus. 302-651-8478

DISTRICT OF COLUMBIA
Commander John Fauntleroy
1435 Kennedy Street, NW
Washington, DC 20011
Phone: Home 202-882-0476; Bus. 202-727-1020

FLORIDA
Lieutenant Commander Marvin C. Williams
145 Carrigan Boulevard
Merrit Island, FL 32952
Phone: Home 305-453-7807; Bus. 305-867-3123
Zip code areas 320- to 322- and 327- to 329-

Commander Thomas C. Murray
2748 S.W. 9th Street
Fort Lauderdale, FL 33312
Phone: Home 305-583-5368
Zip code areas 330- to 334- and 339-

Captain Warren G. Hahn
5111 Poe Avenue
Tampa, FL 33629
Phone: Home 813-831-4943
Zip code areas 326-and 335- to 338-

Captain R. V. Christopher
Rte 2, Box 375
Pensacola, FL 32506
Phone: Home 904-453-2231
Zip code areas 323- to 325-

GEORGIA
Commander John M. Gates
1307 Berkeley Road
Avondale Estates, GA 30002
Phone: Home 404-284-2217

HAWAII
Lieutenent Commander Richard D. Chung
99-683 Kahilinai Place
Aiea, HI 96701
Phone: Home 808-488-4817; Bus. 808-455-9073

IDAHO
Captain Delbert E. Colwell
4114 Hill Road
Boise, ID 83703
Phone: Home 208-343-0084

ILLINOIS
Captain Charles R. Evans, Jr.
1088 Oakwood Avenue
Des Plaines, IL 60016
Phone: 312-824-4493
Zip code areas 600- to 608- and 610- to 611

Charles A. Scherck
208 Belview Avenue
Normal, IL 61761
Phone: Home 309-454-1949; Bus. 309-766-6509
Zip codes areas 609-, 612- to 629-

INDIANA
Captain James Clark
123 W. 3rd Street
Madison, IN 47250
Phone: Home 812-265-5326; Bus. 513-255-4935

IOWA
Commander Richard H. Bell
85 Sunny Circle
Mason City, IA 50401
Phone: Home 515-424-3824, Bus. 515-423-4717

KANSAS
Captain James H. Chapmen
509 N. Broadmoor
Watchita, KS 67206
Phone: Bus. 316-685-4800
Zip code areas 663- to 679-

Captain Eric Matchette
6545 Sagamore Road
Mission Hills, KS 66208
Phone: 913-362-3120
Zip code areas 640- to 641- and 644- to 645-, 647-, 660- to 662-

KENTUCKY
Captain Gayle H. Rees
1829 Dalna Drive
Lexington, KY 40505
Phone: Home 606-299-7316; Bus. 606-293-3601

LOUISIANA
Commander Lester Alfortish
5813 LaFreniere Street
Metairie, LA 70003
Phone: Home 504-889-1000; Bus. 504-888-7171

MAINE
Commander Theodore S. Curtis
P.O. Box 400
Orno, ME 04473
Phone: Home 207-866-2308; Bus. 207-866-4425

MARYLAND
Commander Lawrence A. Ferguson
6034 Burnt Oak Road
Baltimore, MD 21228
Phone: Home 301-788-8478
Zip code areas 210- to 214- and 216-, 218- and 219-

Captain Robert Serino
12915 Allerton Lane
Silver Springs, MD 20904
Phone: Home 301-384-8045; Bus. 202-447-1847
Zip code areas 200- to 209- and 215-, 217-

MASSACHUSETTS
Commander Robert Guillette
217 Kelley Drive
North Attleboro, MA 02760
Phone: Home 617-699-7525; Bus. 617-6997525
Zip code areas 014- to 027-

Lieutenant Commander Thomas J. Keating
42 St. Lawrence Avenue
Springfield, MA 01104
Phone: Home 413-733-0874; Bus. 413-787-7410
Zip code areas 010- to 013-

MICHIGAN
Captain Edward J. Furdak
12536 Lighthouse Court
Plymouth, MI 48170
Phone: Home 313-459-3919; Bus. 313-322-7097

MINNESOTA
Rear Admiral J. Rodney Grubb
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APPENDIX F

Graduate Education Programs

The majority of Naval Academy graduates go directly to sea or to the Fleet Marine Force, thus beginning their professional careers in an operational environment. A few, those with outstanding records as midshipmen, may compete for a limited number of graduate scholarships. Several of these scholarships require enrollment prior to or immediately upon graduation from the Academy. Most graduates, however, will first complete their initial operational tour of duty with the Fleet before they may expect the opportunity to be enrolled in a master's program, either at the Naval Postgraduate School in Monterey, California, or in programs offered at a number of participating civilian universities. Still others will have the opportunity to undertake graduate studies at a later time in their careers.

Graduate Scholarship Programs

NAVY BURKE SCHOLARSHIP (JUNIOR LINE OFFICER ADVANCED EDUCATIONAL PROGRAM)

The Navy Burke Program is open to ten qualified midshipmen in each graduating class for advanced study in the fields of science and engineering. A master's degree is attainable, and school attendance (usually at the Naval Postgraduate School) begins following a post-commissioning operational tour of two to four years.

MARINE CORPS BURKE SCHOLARSHIP (MARINE CORPS OPTION)

Open to ten qualified midshipmen each year who are entering the Marine Corps. Participation in this program allows those selected to attend graduate school approximately two years after commissioning. The field of study for each selectee is chosen by the student from an extensive list of disciplines.

CIVILIAN UNIVERSITY SCHOLARSHIPS AND FELLOWSHIPS

Nationally known scholarships or fellowships are available to qualified graduates of the Naval Academy, much as they are for graduates of other colleges. Graduate studies may be pursued in various fields and in several countries, while receiving pay as a commissioned officer in the Navy or Marine Corps. Up to ten midshipmen from each graduating class may accept immediate scholarships.

National scholarships open to midshipmen are:

- Guggenheim Fellowship *(Daniel and Florence Guggenheim Foundation)*
- Hertz Fellowship *(Fannie and John Hertz Foundation)*
- Marshall Scholarships to British Universities
- National Science Foundation (NSF) Fellowship
- Phi Kappa Phi Foundation Fellowship
- Rhodes Scholarships to Oxford University, England

Other scholarships are available in the following areas:

- Marine Engineering
- Mechanical Engineering
- Naval Architecture
- Nuclear Engineering
- Ocean Acoustics
- Oceanography

Olmsted Foundation Scholarships

The Olmsted Scholar Program was established by the George Olmsted Foundation in cooperation with the Department of Defense and military departments. It provides for two years of graduate education in foreign universities using the foreign languages for selected regular commissioned Navy unrestricted and restricted line officers and unrestricted Marine Corps officers. Three officers from the naval service are admitted to this program each year; two of these are commissioned from the Naval Academy. Nominees from the Naval Academy are considered by a Navy-Marine Corps Selection Committee two to seven years after graduation. The Olmsted Foundation names the selectees from among the principals and alternates recommended by the Navy-Marine Corps Selection Committee.

Joint Master's Degree in Oceanography Program

Up to two midshipmen from each graduating class may be selected for a fully funded graduate program in oceanography at Massachusetts Institute of Technology/Woods Hole Oceanographic Institution (MIT/WHOI). This two-year and three-month program leads to a Master of Ocean Sciences degree and a warfare specialty designator of 1800 (Oceanography).

Index

Academic Advisory, Board, 175
Academic Dean, 180
Academic Departments and Programs, 106
Academic Emphasis, 105
Academic Organization, 100
Academic Program, 94, 106
Accreditation, 16
Administration, Faculty and Staff, 172
Admission, Notification of, 78
Admission Procedures, 68
Advanced Placement, 99
Aerospace Engineering Major, 106
Alternates, Appointment of, 77
Alumni Association, 195
Athletic Association, 165, 190
Athletics, 156
At-Sea Training, 12, 35, 43, 150, 155
Aviation Training, 48
Awards, 192
Bancroft Hall, 19
Board of Visitors, 174
Brigade and Military Program, 24, 25
Brigade Officers, 24, 179
Calendar of Events, 215
Calendar for Candidates, 216
Candidate Guidance, 70, 177, 178
Candidate Visitation, 71, 72
Career Patterns, Officer, 62
Career Patterns, Women Officers, 63
Chapel, 18, 55
Chemistry Major, 126, 127
Chinese, 139
College Entrance Examination Board Tests, 72
Commandant of Midshipmen, 24, 178
Common Plebe Year, 96
Competitive Nominations, 73
Computer Science, Department of, 185
Computer Science Major, 121
Computer Facilities, 102
Counseling and Guidance, 99
Cultural Affairs, 51
Daily Schedule, 29
Dean's List, 104
Degree Requirements, 104
Dental Standards, 203
Distribution Requirements, 100
Duty, First, 60
Economics Major, 141, 142
Educational Resources Center, 177
Electrical Engineering Major, 109
Eligibility Requirements, General, 68
Engineering and Weapons, Division of, 180
English and History, Division of, 183
English Major, 133
Entrance Information and Procedures, 68
Extracurricular Activities, 166
Facilities, 18
Faculty, 172
Finances, 59, 79
First Class Year, 43, 155
Foreign Students, 204
Former Midshipmen, 77
French, 139
General Engineering Major, 111
German, 139
Grading, 104
Graduate Study, 211
Graduation Requirements, 104
High School Program, 68
History Major, 136
History, Naval Academy, 14
Honor Concept, 22, 46
Honor Societies, 192
Language Studies, 139
Leadership and Law, 145, 189
Leave and Privileges, 50
Legal Assistance, 59
Lejeune Hall, 20
Library, 18, 101
Major, Choosing a, 96
Marine Engineering Major, 114
Mathematics and Science, Division of, 121, 185
Mathematics Major, 123
Mechanical Engineering Major, 111
Medical and Dental Care, 59
Medical Examination, 77, 200

Medical Qualifications, 200
Midshipmen, Former, 77
Military Organization, 24
Mission, 2, 23
Museum, 20
Naval Academy Information
  Program, 208
Naval Academy Preparatory School, 83
Naval Architecture Major, 115
Naval Institute, 196
Naval Profession, 8, 60
Naval Systems Engineering,
  Department of, 116, 182
Nominations, 73
Nuclear Power Program, 62
Oath of Office, 206
Ocean Engineering Major, 115
Oceanography Major, 128
Officer Career Patterns, 66
Officer Education and Training, 66
Pay, 78
Physical Aptitude Examination, 78
Physical Education, 53, 148, 155, 190
Physical Examinations, 77
Physical Science Major, 123
Physics Major, 130
Plebe Indoctrination, 25
Plebe Year, 25, 96
Political Science Major, 143
Postgraduate Study, 103, 211
Pre-Candidate Questionnaire, 72
Previous Candidates, 77
Principal-Alternate Nominations, 75
Prizes, 192
Professional Course Requirements, 100
Professional Development, Division
  of, 145, 189
Professional Training Program, 148
Profile, Entering Class, 78
Questions and Answers, 85
Religious Activities, 55
Residence, 105
Resignations and Separations, 81
Russian, 140
Sailing, 48, 164
Schedule of Instruction, 105
Scholarships, 83, 211
Scholastic Records, 68
Scholastic Requirements, 68
Seamanship and Navigation,
  Department of, 146, 190
Second Class Year, 35, 154
Seminars, 147
Service Obligation, 81
Spanish, 139
Special Programs, Academic, 103
Sports, 156
Staff and Faculty, 172
Superintendent, 4, 176
Superintendent's List, 104
Systems Engineering Major, 118
Tests, 72
Third Class Year, 35, 154
Trident Scholars, 103
United States and International Studies,
  Division of, 139, 188
Visual Requirements, 77, 87, 201
Weapons and Systems Engineering,
  118, 183
Weekend Leave, 50
Weight Standards, 201
Women, Admission of, 77
Women Officers, 63
Yard Patrol Squadron, 46

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Tentative Calendar, 1986–1987

1986

May 9	Friday	Orientation Day, Class of 1990.
July 7	Monday	Class of 1990 enters.
August 8–10		Parents' Open House, Class of 1990.
August 17	Sunday	Leave and summer training expire for three upper classes.
August 21	Thursday	First semester begins.
September 1	Monday	Labor Day, holiday.
October 4	Saturday	Homecoming.
October 6–10		Mid-term exams.
October 13	Monday	Columbus Day, holiday.
November 11	Tuesday	Veterans' Day, holiday.
November 27	Thursday	Thanksgiving Day, holiday.
December 6	Saturday	Brigade at Army-Navy game.
December 10–19		Examinations. Christmas leave begins after last scheduled examination or military duty, whichever is later.

1987

January 6	Tuesday	Leave ends.
January 8	Thursday	Second semester begins.
January 19	Monday	King's Birthday, holiday.
February 16	Monday	Washington's Birthday, holiday.
February 23–27		Mid-term exams. Mid-term leave begins after last scheduled class or military duty, which is later, but not earlier than 0800 Friday, February 27.
March 8	Sunday	Mid-term leave ends.
April 18–20		Easter leave.
April 27–May 6		Examinations. Leave begins after last scheduled examination or military duty, whichever is later.
May 11	Monday	Leave ends.
May 15	Friday	Commissioning Week begins.
May 20	Wednesday	Graduation.

This catalog should not be considered a contract between the United States Naval Academy and any prospective candidate. The curriculum, policies, and dates are subject to change to meet varying requirements of the Navy.

Calendar for Candidates, Class of 1991

1986*

Spring *of junior year.* Write your U.S. representative and two U.S. senators requesting a nomination. Although many congressmen will accept later requests, some into the early months of your senior year, others select their nominees *much* earlier. Write the Vice President for a nomination (*very* competitive) if you believe you are *highly* qualified for admission. Request a Precandidate Questionnaire from the Academy's Director of Candidate Guidance (code 304) and submit to the Naval Academy.

Jan. 25. SAT test. Register by December 20, 1985.
NOTE: The average of all SAT/ACT test scores taken after December of the student's junior year will be used in evaluating a candidates scholastic qualification.

Feb. 8. ACT test. Register by January 10.

Mar. 15. SAT test. Register by February 7.

Apr. 12. ACT test. Register by March 14.

May 3. SAT test. Register by March 28.

June 1. Prospective candidates commence taking scheduled medical examinations at designated medical examining centers. Each is individually notified by the Department of Defense Medical Examination Review Board (Colorado).

June 7. SAT test. Register by May 2.

June 14. ACT test. Register by May 16.

July 1–February 15. If eligible (as explained in Chapter 5), write the Superintendent, U.S. Naval Academy (Attn: Candidate Guidance Office) requesting Presidential and/or other military service-connected nominations.

September 1. Beginning on this date, nominees and selected prospective nominees may expect to be contacted by a local representative of the Naval Academy Information Program.

October 11. SAT test (limited states). Register by September 19.

October 16. Beginning on this date, early offers of appointment are made by the Naval Academy to outstanding candidates. Offers continue into the following spring as admissions files on candidates are completed and additional well-qualified candidates are identified.

October 25. ACT test. Register by September 26.

November 1. Deadline for receipt by the Vice President of requests for nominations. Use congressional letter format, Appendix A, as guide.

November 7. SAT test. Register by October 2.

December 5. SAT test. Register by October 30.

December 13. ACT test. Register by November 14.

1987*

January 23. SAT test. Register by December 18, 1986.

February 7. ACT test. Register by January 9.
NOTE: This is the last test that can be accepted for USNA class of 1991.

May 1. With but few exceptions, all candidates will be notified on or before this date whether or not they have been accepted for entry.

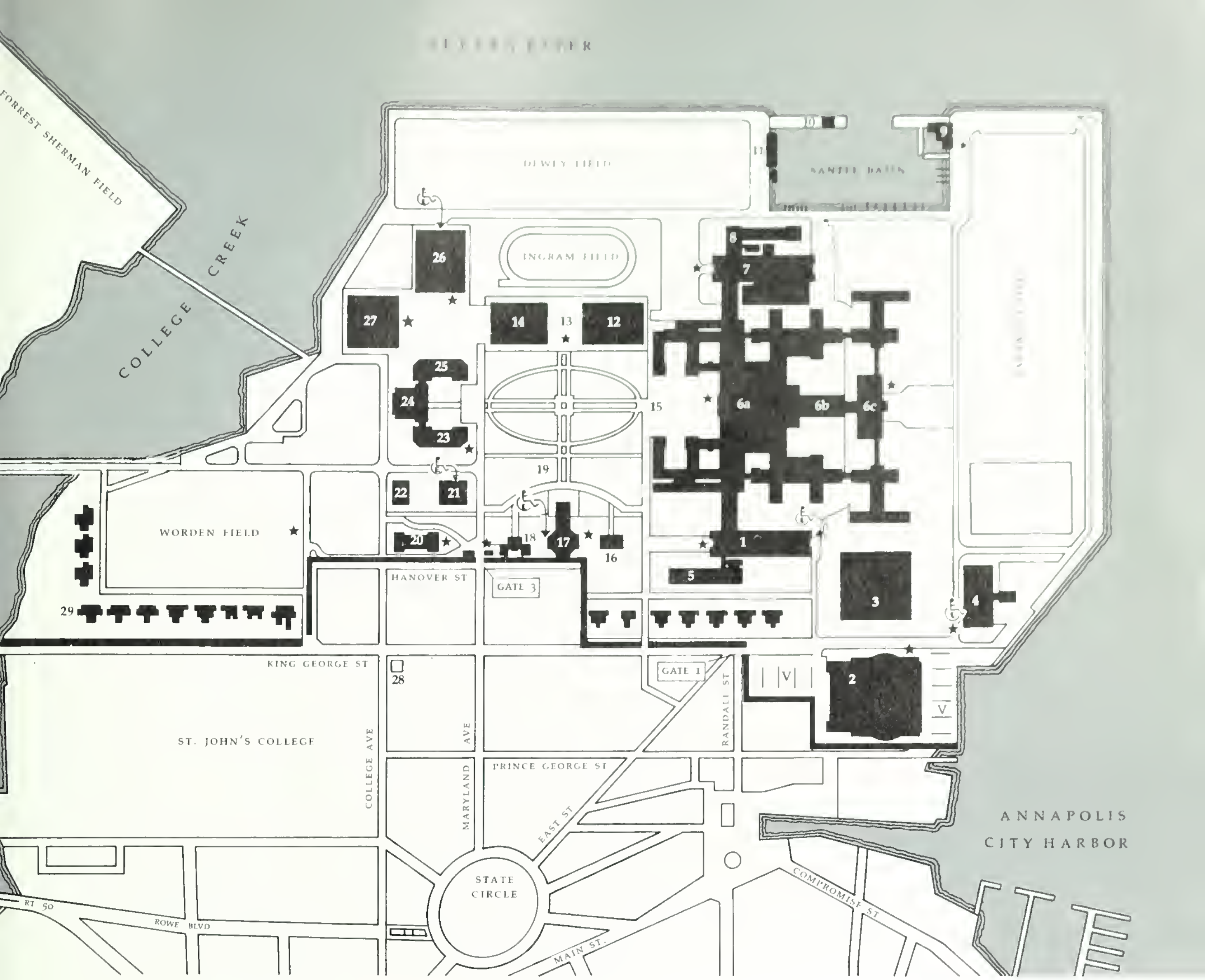
May 9. Orientation Day at the Naval Academy for candidates who have been offered appointments as midshipmen with the class of 1991.

May 11. Naval Academy Preparatory School class selected.

July 1. (tentative). Class of 1991 reports to the Naval Academy and takes oath of office as midshipmen.

*See your guidance counselor for special information relating to test schedules and registration forms.

Note: Please insure that *you* request the applicable testing service(s) to forward the results of your examinations to the Naval Academy (SAT code 5809, ACT code 1742).


SEVERN RIVER
FORREST SHERMAN FIELD
COLLEGE CREEK
DEWEY FIELD
SANTEE BASIN
INGRAM FIELD
WORDEN FIELD
HANOVER ST
GATE 3
KING GEORGE ST
GATE 1
RANDALL ST
ST. JOHN'S COLLEGE
COLLEGE AVE
MARYLAND AVE
PRINCE GEORGE ST
EAST ST
STATE CIRCLE
RT 50
ROWE BLVD
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V

1. Dahlgren Hall *(Midshipmen Activity Center)*
2. Halsey Field House *(Trophy Room)*
3. Lejeune Hall *(Swimming/Wrestling Areas)*
4. Ricketts Hall *(Visitors' Center, Visiting Team Housing, Enlisted Barracks)*
5. Ward Hall
6. Bancroft Hall
   - 6a. Rotunda & Memorial Hall
   - 6b. King Dining Hall
   - 6c. Mitscher Hall *(Chaplains' Center, All-Faiths Chapel, & Auditorium)*
7. Macdonough Hall
8. Luce Hall
9. Robert Crown Sailing Center
10. Hendrix Oceanography Laboratory
11. Vandergrift Cutter Shed
12. Chauvenet Hall
13. Radford Terrace
14. Michelson Hall
15. Tecumseh Statue
16. Buchanan House *(Superintendent's Quarters)*
17. Chapel *(John Paul Jones' Crypt)*
18. Administration Building
19. Herndon Monument
20. Officers' & Faculty Club
21. Preble Hall *(USNA Museum & U.S. Naval Institute)*
22. Leahy Hall *(Candidate Guidance Center)*
23. Sampson Hall
24. Mahan Hall *(Auditorium)*
25. Maury Hall
26. Rickover Hall
27. Nimitz Library
28. Alumni House
29. Officers' Housing
30. Hubbard Hall *(Crew Team)*
31. USNA Cemetery *(Columbarium)*

♿ Entrance For Handicapped
★ Rest Rooms
V Visitor Parking

Lost & Found: Main Gate (Gate 3)

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3 1262 09684 9095

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EX SCIENTIA TRIDENS

Tom Freeman